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Management of Construction and Real Estate Under Conditions of Market Instability

MONOGRAPH



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VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

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Monograph deals with significant theoretical and practical issues on construction and real estate market fluctuations, their determinants and crisis management measures. It discusses real estate markets fluctuations in Lithuania and abroad, their consequences and problem-solving experiences. Significance of construction and real estate market in the economy is emphasised. The monograph is interdisciplinary in nature; studies of the authors can be linked to construction, economics and management fields. Monograph contains a detailed analysis of the construction and real estate market, and the results are relevant not only in the academic context, but significant for all stakeholders of construction and real estate markets. The presented data, the theoretical and practical insights can be useful for real estate appraisers, developers, construction businesses, public authorities, as well as master and PhD students.

Monograph consists of three coherent chapters and aims to analyse fluctuations in different construction and real estate market segments in detail. Furthermore, determinants of crises and consequences as well as possible measures for construction and real estate management under conditions of market instability are presented.

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INTRODUCTION

Economic crises are linked to the large-scale prices corrections in markets. Reasons and consequences of these corrections have a lot of similarities from historical perspective. The Great Depression in the third decade of the twentieth century, the Internet bubble, the recent global financial crisis, which started in the real estate sector of the USA, are the results of interactions of many factors. It is said that all crises are similar; however, each crisis has its own particular historical context. Moreover, it should be noticed that crises are influenced by a number of rational and irrational factors, thus reasons of the crises and the consequences need to be holistically considered.

History shows that the growth in real estate prices is not sustainable: sooner or later the prices stabilise, as new buyers are not coming to the market and the demand decreases. Decrease of real estate prices encourages massive sales of assets, as investors hope to regain at least part of the amounts invested, construction business' expectations become pessimistic, new construction projects are suspended or postponed for the future. After the market downturn recovery period starts, a new increase in prices begins and the cycle repeats again.

The real estate sector plays an important role to the whole economy, especially to the financial sector. For instance, the development of new financial instruments and relatively smooth cycle in late 90's and early 2000 in Lithuania gave an impression that the construction and real estate market is relatively safe. Unfortunately, the recent crisis demonstrated opposite situation. Capital market did not behave rationally and new financial instruments helped to create a real estate bubble that burst and led to a dramatic economic slowdown.

The recent crisis has shown that complex derivative instruments do not always effectively allocate financial resources, i.e. direct them to investors with the highest return on investment projects and transfer risk to those who can take it. On the other hand, both central banks and governments responded quickly and purposefully to the events in financial markets by providing necessary liquidity and solvency support to financial institutions.

Construction and real estate market downturn, as evidenced by history and experience of the world, is inevitable. Recent economic crisis in construction and real estate sector has set new goals and objectives for market players. There is a need to perform detailed analysis of the situation and look for strategies to make this sector function effectively. There are many crisis management strategies developed in the world, however, successful construction and real estate management strategy must be aligned with a country's economic, social, political, legal and other environmental conditions. Analysis of construction and real estate market fluctuations and the affecting factors helps to better understand the processes and key determinants of market fluctuations and thus to predict future

market trends as well as implement preventive measures for crisis management.

Investments in real estate can make significant profit for investors and banks financing those projects. However, due to a large scale of projects and specific nature of their cycles, real estate can lead to huge losses and trigger financial and economic crises, for this reason it is very important to have comprehensive information about the market.

This monograph deals with significant theoretical and practical issues on construction and real estate market fluctuations, their determinants and crisis management measures. It discusses real estate markets fluctuations in Lithuania and abroad, their consequences and problem-solving experiences. Significance of construction and real estate market in the economy is emphasised. The monograph is interdisciplinary in nature; studies of the authors can be linked to construction, economics and management fields. Monograph contains a detailed analysis of the construction and real estate market, and the results are relevant not only in the academic context, but significant for all stakeholders of construction and real estate markets. The presented data, the theoretical and practical insights can be useful for real estate appraisers, developers, construction businesses, public authorities, as well as master and PhD students.

Monograph consists of three coherent chapters and aims to analyse fluctuations in different construction and real estate market segments in detail. Furthermore, determinants of crises and consequences as well as possible measures for construction and real estate management under conditions of market instability presented.

Chapter 1 aims to reveal the construction and real estate market characteristics and the causes of market fluctuations. It provides comprehensive real estate concept, distinguishes real estate market characteristics, and highlights the importance of the real estate market to development of economy. Basing on empirical research results, provided by scientists from Lithuania and abroad, detailed analysis of the construction and real estate market cycles, their indicators presented. An overview of the classical theories on the formation of prices bubbles, their types, determining factors and impacts on various economies, discussed. Furthermore, fiscal and monetary policy measures used to manage crises in the various countries as well as models for construction and real estate crisis management considered. Detail analysis of data provided by State Enterprise Centre of Registers, Lithuanian Department of Statistics and the EU Statistical Office (Eurostat) is performed, development and fluctuations of Lithuania's construction and real estate market reviewed, main affecting factors discussed.

Chapter 2 deals with the land market and its regulatory influence on the construction and real estate market. Analysis of land market characteristics, determinants of land supply and demand, agricultural land management issues provided. On the basis of experience of foreign countries, the influence of land

market regulatory solutions to the market in general as well as to real estate prices discussed. Detailed analysis of Lithuania's land market development, regulatory context, land reform and the major problems of its implementation provided. Land planning and management system, legal environment in Lithuania presented and abilities to use current system for construction and real estate management discussed.

Due to the fact that high-quality housing at an affordable price in a safe place is a basic human need and right, Chapter 3 of the monograph focuses on residential real estate market analysis. Characteristics of the residential real estate market are investigated, influence to the economy, supply and demand affecting factors considered. Basing on empirical research results provided by scientists from Lithuania and abroad, housing policy models in different countries analysed, the determinants of housing market fluctuations considered, the housing affordability and sustainability indicators analysed. Using the data of the European Union's Statistical Office (Eurostat), the State Enterprise Centre of Registers, Lithuanian Department of Statistics, detailed analysis of the housing in the European Union countries and Lithuania performed. Furthermore, multiple criteria assessment methods used in order to assess sustainability of Lithuania's housing market in comparison to other European countries.

This monograph is the result of joint investigations of scientists from Vilnius Gediminas Technical University and specialists from the State Enterprise Centre of Registers.

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1. CYCLICAL NATURE OF CONSTRUCTION AND REAL ESTATE MARKETS

1.1. Understanding the Importance of Real Estate

In our common understanding the real estate is land and anything that is permanently affixed to it. Fixtures include buildings, premises, fences, and supplements attached to buildings, such as lighting, plumbing, heating, etc.

Real estate is the single largest component of wealth in our society (Ling, Archer 2012; Galinienė 2015). Because of its magnitude, real estate plays a key role in shaping the economic condition of individuals, families, and enterprises. Changes in the value of real estate can dramatically affect the wealth of businesses, their capacity to develop and thus significantly influence economy of the country.

Real estate resources can greatly affect an ability to attract and support profitable business activities in the country or region, as well as to provide secure, convenient, and affordable living environments for its citizens. The adequacy of the housing stock, as well as the public infrastructure, including roads, bridges, dams, airports, schools, parks, etc. – they all affect the quality of life in a particular country or region.

Real estate has been estimated to represent approximately one-half of the world's total economic wealth. In addition, it is often viewed as an important symbol of strength, stability, and independence (Ling, Archer 2012).

From the assumptions presented above, it is not surprising that real estate has been at the centre of many regional disputes. It has been, and continues to be, a vital resource. The prominence of real estate means that decisions about it also are important. For the individual, the firm, and the region, better decisions about the creation and use of real estate assets bring greater productivity, greater wealth, and a better set of choices for life (Ling, Archer 2012). On the other hand, as history reveals, real estate market can be a reason of serious economic problems, including global crisis that started in the real estate market of the USA.

Almost all decisions about the acquisition, disposition, or improvement of real estate depend on some assessment of the real estate's value. According to TEGOVA European Valuation Standards (2012a), market value is a key concept in establishing an informed expectation as to the price for something, one that is neutral as between buyer and seller. The nature of the market in which that value is determined will differ according to the subject of the trade while market conditions will vary with the changing balance of supply and demand, changing knowledge, fashion, rules, expectations, credit conditions, hopes of profit and

other circumstances. “Value” does not mean a specific price, the actual sum that may prove to be paid in a given transaction between specific parties. At an individual level, the value of an asset to a person will reflect its usefulness to him when judged against his resources and opportunities. In the context of a market with competing parties, it is rather an estimate of the amount that could reasonably be expected to be paid, the most probable price in market conditions at the valuation date. While the asset in question may have different values for different individuals who may be in the market, its market value is the estimate of the price in the present market on assumptions that are deliberately neutral to achieve a standard basis of assessment for both buyers and sellers.

When people think of real estate, they often think of the homes in their community or the business of buying and selling houses. This is probably because the personal investment that most households make in their home represents their primary involvement in the real estate market (see Chapter 3 of monograph for residential market). Definitely, real estate includes not only homes, but also other key elements of the **built environment** – places of work, commerce, government, education, recreation, entertainment, etc.

The notion of built environment is relatively recent. In common was started to be used in the literature since the mid-1970s. The origin is clearly in anthropological and behavioural studies concerning the influence of form and space on the individual and social behaviour (Rapoport 1976). The concept has evolved in anthropology and in more recent research the built environment was understood as the result of a process of social construction (Tupénaité 2010).

The term “built environment” came into widespread use in the 1990s (Crowe 1997). In common parlance, the built environment generally refers to the “man-made surroundings that provide the setting for human activity, ranging from the large-scale civic surroundings to the personal places” (Moffatt, Kohler 2008). However, there is still no unified view and definition of this concept in the scientific literature. Various authors analysed built environment from the different perspectives, research goals and activity spheres.

Broad understanding of the built and human environment was given by Bartuska *et al.* (2007). Author suggests defining the built environment by four interrelated characteristics. First, it is extensive; it is everywhere; it provides the context for all human endeavours. More specifically, it is everything humanly created, modified, or constructed, humanly made, arranged, or maintained. Second, it is the creation of human minds and the result of human purposes; it is intended to serve human needs, wants, and values. Third, much of it is created to help human deal with, and to protect human from, the overall environment, to mediate or change this environment for human comfort and well-being. Last, an obvious but often forgotten characteristic is that every component of the built environment is defined and shaped by context; each and all of the individual

elements contribute either positively or negatively to the overall quality of environments both built and natural and to human-environment relationships. These impacts are almost always local, and more and more are experienced at every scale, including global and even planetary.

Another concept states that the built environment includes all buildings and living spaces that are created, or modified by people. In addition to the buildings and spaces themselves, it also includes the infrastructural elements such as waste management, transportation and utility transmission systems put in place to serve this building space (Sarkis *et al.* 2008). From this point of view, the built environment addresses all buildings, housing, infrastructures, fixed equipment and communities.

In other words, the built environment refers to human-made spaces that they live and work in. A built environment is designed with a purpose, typically to meet some optimal set of organisational, customer, and employee needs. These needs often contradict each other and complicate decision-making about the built environment. The built environment is the result of design – organization, employee, and customer needs are designed into the space (Mallak *et al.* 2003).

Two terms – “real estate” and “property” – are often used in together in common language, however, it should be noted that these terms have different meanings (Ling, Archer 2012). Definitely, ***real estate is a property*** as the term “property” refers to anything that can be owned, or possessed. However, property can be a tangible asset or an intangible asset. Tangible assets are physical, such as computers, automobiles, land, or buildings. Intangible assets are non-physical and include contractual rights (e.g., mortgage and lease agreements), financial claims (e.g., stocks and bonds), interests, patents, or trademarks, etc.

Furthermore, the term real estate is used in other three fundamental ways (Ling, Archer 2012) (see Fig. 1.1). First, its most common use is to identify the ***tangible assets of land and buildings***.

When viewed purely as a tangible asset, real estate can be defined as the land and its permanent improvements. Improvements on the land include any fixed structures such as buildings, fences, etc. Improvements to the land include the components necessary to make the land suitable for building construction or other uses. These improvements are often referred to as infrastructure, and consist of the streets, walkways, storm water drainage systems, and other systems such as water, sewer, electric, and telephone utilities that may be required for land use. Subject to legal and practical limits, it should be noted that real estate includes not only the surface of the earth, but also the area above and below the surface (Ling, Archer 2012), in other words, everything that in economics is referred as land resources.

Tangible assets include both real property and personal property. In professional practice, the terms “real property” and “real estate” are treated as

interchangeable. Personal property refers to things that are movable and not permanently affixed to the land. For example, a motor home is personal property, while a custom “site-built” house is real property. A mobile home may be real or personal property, depending on how it is secured to the land and legally recognized by the jurisdiction (e.g., city, county, or state) in which it is located (Ling, Archer 2012).



Fig. 1.1. Understanding of real estate

Real estate is also used to denote the **“bundle” of rights** that are associated with the ownership and use of the physical assets (Ling, Archer 2012).

Although real estate is a tangible asset, it can also be viewed as a “bundle” of intangible rights associated with the ownership and use of the site and improvements. These rights are to the services, or benefits, that real estate provides its users. For example, real property provides owners with the rights to shelter, security, and privacy, as well as a location that facilitates business or residential activities. This concept of real property as a bundle of rights is extremely important to understanding real estate, and is the subject (Raslanas 2010a, b; Ling, Archer 2012; Galinienė 2015).

The bundle of property rights may be limited in numerous ways. It typically is reduced by land use restrictions. Also, the rights can be divided and distributed among multiple owners and non-owners. For example, an apartment owner divides his full interest in the property when he leases an apartment unit and grants to a tenant the right to occupy and control access to the unit. Similarly, the tenant may divide his interests by subleasing the apartment to another. As another example, an owner may purchase a property that has a utility access

granted through a portion of the property. Thus, real estate can also be viewed as a bundle of rights inherent in the ownership of real property (Ling, Archer 2012).

The value of a bundle of rights is a function of the property's physical, locational, and legal characteristics. The physical characteristics include the age, size, design, and construction quality of the structure, as well as the size, shape, and other natural features of the land. For residential property, the locational characteristics include convenience and access to places of employment, schools, shopping, health care facilities, and other places important to households. The location characteristics of commercial properties may involve visibility, access to customers, suppliers, and employees, or the availability of reliable data and communications infrastructure. The physical and location characteristics required to provide valuable real estate services vary significantly by property type (Ling, Archer 2012).

Finally, the term real estate may be used when referring to the industry or business activities related to the acquisition, operation, and disposition of the physical assets (Ling, Archer 2012).

The term "real estate" frequently is also used to refer to the *industry activities* associated with evaluating, producing, acquiring, managing, and selling real property assets. *Real estate professions* vary widely and include:

- real estate brokerage, leasing, and property management services;
- appraisal and consulting services;
- site selection, acquisition, and property development;
- construction;
- mortgage finance and securitization;
- corporate and institutional real estate investment;
- government activities such as planning, land use regulation, environmental protection, and taxation, etc.

For example in Lithuania, Vilnius Gediminas Technical University prepares real estate management professionals in multidisciplinary bachelors' and master's study programmes. Outcomes of the programmes include all of the knowledge and skills mentioned above. Real estate career opportunities in areas such as management, brokerage, leasing, appraisal, construction, development and consulting often offer entrepreneurial-minded individuals the ability to observe and understand local real estate markets. Activities of state government and municipal units such as departments of environment, building, commerce, planning, housing, market analysis, taxation, etc. necessitate the employment of real estate research analysts and professionals.

The construction industry plays an essential role in the socio economic development of a country. The activities of the industry have a lot of significance to the achievement of national socio-economic development goals of providing infrastructure, sanctuary and employment. It includes hospitals, schools,

townships, offices, houses and other buildings; urban infrastructure (including water supply, sewerage, drainage); highways, roads, ports, railways, airports; power systems; irrigation and agriculture systems; telecommunications, etc. Furthermore, construction deals with all economic activities directed to the creation, renovation, repair or extension of fixed assets in the form of buildings and land improvements (Osei 2013).

It should be noted that construction industry (secondary sector of economy) provides supply of real estate and real estate, as a general term, describes the built environment, which plays a vital role in every aspect of the European economy, society and environment. Businesses and society can't function without the services of commercial property, including the provision of offices, shops, factories, housing and many other forms of real estate. The commercial property sector delivers and manages the infrastructure needed for entrepreneurship to thrive. It is therefore a fundamental source of employment and economic growth, and a major contributor in addressing two critical challenges of our time: providing livable and functioning cities for a growing urban population and reducing the environmental footprint of the built environment (EPRA 2012).

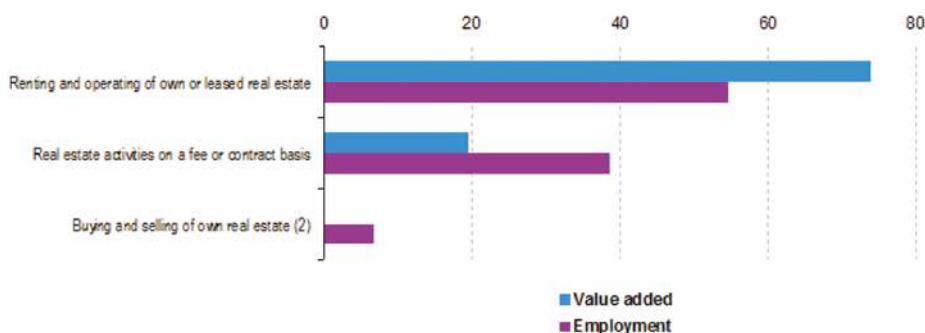
The real estate market is very important for every country, not merely because it ensures construction structures and infrastructure necessary for life and work, but also because it has a strong, multiple impact on the development of nation's entire economy. Real estate market trends are strong indicator of trends in the entire economy (Golob *et al.* 2012; Galinienė 2015).

Because of the significant influence of real estate on the nation's economy, investors monitor real estate construction, construction permit activity, and real estate sales figures. Housing starts and sales are widely viewed as leading economic indicators (Ling, Archer 2012).

The efficiency of the process through which the European real estate industry invests, develops, supports, and maintains the built environment, and services its clients, is of crucial importance to policy makers. Although there are many factors that influence the well-being of European citizens and the European economy, a performing real estate sector provides the basic platform for all these other factors to deliver their full potential, and for the European economy to thrive and remain competitive (EPRA 2012).

Just over 1 in every 20 enterprises within the EU-27's non-financial business economy operated within real estate activities in 2010, a total of just over 1.1 million enterprises. Together they employed 2.6 million persons, equivalent to 2.0% of the non-financial business economy workforce; while they generated EUR 230 billion of value added which was 3.9% of the non-financial business economy total. As its focal point is on land and property, the real estate activities sector is clearly a capital-intensive activity and displays particularly high levels of tangible investment (see Fig. 1.2) (Eurostat 2013).

Studies indicate that real estate in all its forms accounts for nearly 20% of economic activity. The commercial property sector alone directly contributed EUR 285 billion to the European economy in 2011, about 2.5% of the total economy and more than both the European automotive industry and telecommunications sector. It directly employs over four million people, which is not only more than the car industry and the telecommunications sector, but also greater than banking (EPRA 2012).



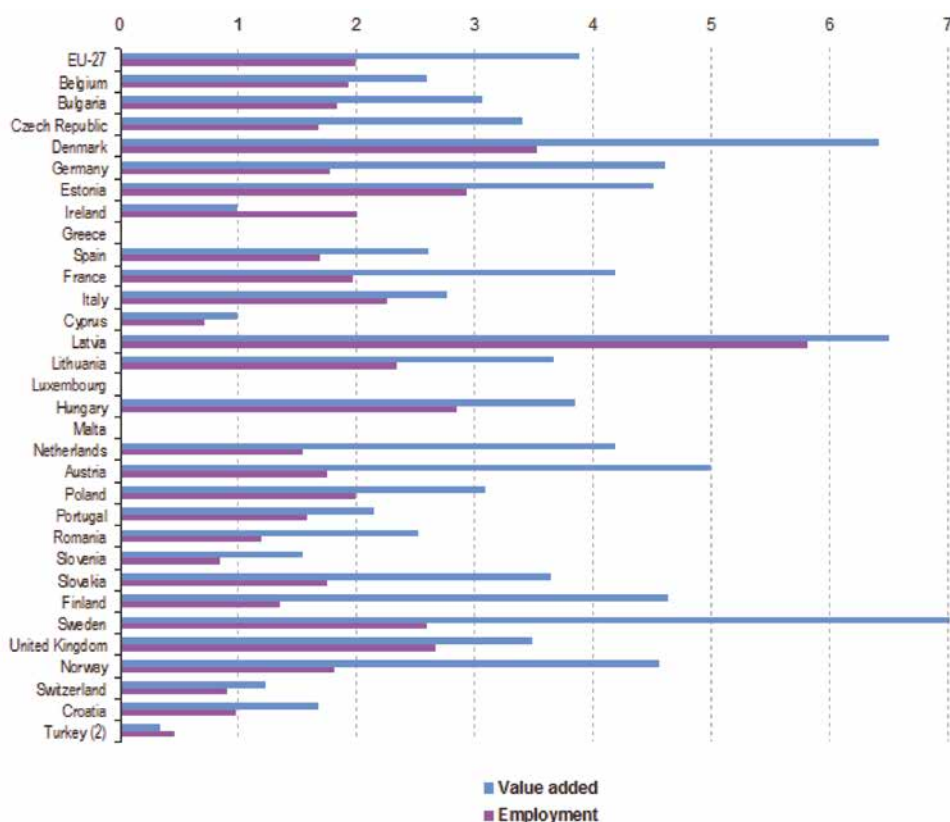
Source: Eurostat (2013)

Fig. 1.2. Employment and EU value added in the real estate sector, 2010

According to Eurostat (2013), Germany had by far the highest value added for real estate activities in 2010 among the EU Member States, generating 26.0% of the EU-27 total, which was slightly less than the combined shares of France (15.8%) and the United Kingdom (14.0%), and well above Germany's share of EU-27 value added within the non-financial business economy as a whole (21.9%). Nevertheless, there were four Member States that were more specialised in this sector (in value added terms). This was particularly true for Sweden, Latvia and Denmark, as real estate activities accounted for 7.2%, 6.5% and 6.4% respectively of their non-financial business economy value added in 2010; the other country with a higher specialisation in real estate activities than in Germany was Austria (5.0%), while the degree of specialisation was the same in Germany as for Finland (4.6%). In value added terms, the least specialised Member States were Ireland and Cyprus where real estate activities accounted for 1.0% of non-financial business economy value added. Among the non-member countries, Norway – in keeping with its Nordic neighbours – reported a relatively high degree of specialisation in this sector, as real estate activities provided 4.6% of the value added that was generated within the Norwegian non-financial business economy in 2010. By contrast, both Switzerland and Croatia were relatively unspecialised, as this sector contributed 1.2% and 1.7% to the total value added within their respective non-financial business economies (well below the EU-27

average of 3.9%). A much lower share (0.3%) was recorded in Turkey, although this information relates to 2009.

Italy had the greatest value added for the buying and selling of own real estate subsector in 2010 (EUR 3.1 billion), although the latest data marked a reduction of almost a quarter in relation to the previous year (–24.8%). Germany had the highest level of value added for the renting and operating of own or leased real estate subsector (EUR 49.1 billion or 28.8% of the EU-27 total), while the United Kingdom was the leading player in the real estate activities on a fee or contract basis subsector (EUR 11.9 billion or 26.6% of the EU-27 total) (Eurostat 2013).



Note: Greece, Luxemburg and Malta not available; data of Turkey is for year 2009.

Source: Eurostat (2013)

Fig. 1.3. Relative importance of real estate activities (NACE Section L), 2010
(% share of value added and employment in the non-financial business economy total)

While these large Member States accounted for the largest shares of activity, the highest degrees of specialisation were recorded elsewhere. For the buying

and selling of own real estate subsector Hungary and Portugal were the most specialised countries and the only Member States where this subsector accounted for more than 1.0% of non-financial business economy value added. Sweden, Denmark, Estonia and Latvia were the most specialised Member States for the renting and operating of own or leased real estate subsector with these activities generating more than 4.0% of non-financial business economy value added, a share that rose as high as 6.5% in the case of Sweden. The most specialised Member States for real estate activities on a fee or contract basis were Latvia, Poland, the United Kingdom and Slovakia, as these were the only Member States to report that this subsector contributed more than 1.0% to non-financial business economy value added; the highest share was recorded in Latvia (2.2%) (Eurostat 2013) (see Fig. 1.3 for country profiles).

Guo *et al.* (2011) notes, that the real estate market has high impact on the economic growth. But they find out that the traditional mode of the real estate on operation is disadvantageous to the realisation of national economic interest, restricts the amendatory process of national living environment, and hinders the efficiency of market economy. They also find out that the facilitation of the development of real estate industry on economic growth can be carried out by the two aspects of the development and the scale of real estate. First of all, the sales of the real estate directly promote the development of the sales industry of the real estate; in addition, due to the improvement of the living environment, it increases the promotion of real estate industry on related industries such as decoration, furniture, electric equipment, etc.

Market competition distributes resources (i.e., goods, services, and capital) among the various users. The market's forces of demand and supply interact within the economy to determine the price at which goods, capital, and services are exchanged and to whom they are allocated. Real estate resources are allocated among its various users – individuals, households, businesses, and institutions – in the real estate market. Real estate values derive from the interaction of three different sectors in the economy, namely, the user markets, the capital markets and the government (Ling, Archer 2012). A brief introduction these sectors presented below.

Real estate user markets are characterized by competition among users for physical locations and space. This competition determines who gains the use of each parcel of land and how much they must bid for its use. The primary participants in user markets are the potential occupants, both owner occupants and tenants, or renters. Ultimately, the demand for real estate derives from the need that these individuals, firms, and institutions have for convenient access to other locations, as well as for shelter to accommodate their activities. Based on the financial positions of households and firms and their wants and needs, they decide either to own and occupy property, or to lease property from others (Ling, Archer 2012).

The capital markets allocate financial resources among households and firms requiring funds. Participants in the capital markets invest in stocks, bonds, mutual funds, private business enterprises, mortgage contracts, real estate, and other opportunities with the expectation of receiving a financial return on their investment. Funds flow from investors to the investment opportunities yielding the highest expected return (i.e. the greatest benefit), considering risk. Thus, real estate competes for scarce investment capital with a diverse menu of other investment (Ling, Archer 2012).

Government affects real estate markets, and therefore values, in a host of ways. Local government has perhaps the largest influence on real estate. It affects the supply and cost of real estate through zoning codes and other land use regulations, fees on new land development, and building codes that restrict methods of construction. Further, local government affects rental rates in user markets through property taxes. Finally, it profoundly affects the supply and quality of real estate by its provision of roads, bridges, mass transit, utilities, flood control, schools, social services, and other infrastructure of the community (Ling, Archer 2012).

The national government influences real estate in many ways. Income tax policy can greatly affect the value of real estate, and therefore the incentive to invest in it. Housing subsidy programs can have enormous effects on the level and type of housing construction.

In addition, laws protecting the environment and endangered species have significantly affected the use of real estate. Finally, national fair housing laws and other civil rights legislation are very important influences on housing markets. As it will be discussed later, government has a key role in real estate crisis management (Ling, Archer 2012).

There is an interaction of the above discussed three value-determining sectors. In user markets, households and firms compete for the currently available supply of locations and space. This competition determines the level of rental income for each submarket and property, and determines how reliable or uncertain the income is. Capital markets provide the financial resources necessary for the development and acquisition of real estate assets. Within the capital markets, the returns investors require for a broad range of available investment opportunities, including real estate, are determined. Finally, in the interaction between user and capital markets, the expected stream of rental income is capitalized into value through “discounting,” which is the process of converting expected future cash flows into present value. Discounting incorporates the opportunity cost of waiting for the uncertain cash flows (Ling, Archer 2012). As noted above, government influences on this value-determining process are numerous, ranging from local government land use controls and property taxes, to national government income tax policy.

Real estate construction historically has been a volatile process because real estate prices and costs tend to be volatile. The increase in supply by producers tends to lower rents in the user markets and to lower property values (prices), which reduces the feasibility of additional new construction. Thus, building booms and slumps often characterize real estate production. To compound the volatility further, real estate values also can be affected by shocks to the capital markets. For example, if interest rates rise, property values will generally fall, again rendering construction less profitable. Finally, construction costs can be very volatile. Organised labour disputes, or unexpected events causing shortages in lumber, steel, or other building materials, can severely damage the financial viability of both small and large real estate development (Ling, Archer 2012).

1.2. Main Features of Construction and Real Estate Markets

As is was discussed in Section 1.1, the real estate market is the interconnected system of the market mechanisms which provides development, transfer, management and financing of real estate. The real estate market represents set of regional and local markets which are significantly distinct from each other on price and risk levels, efficiency of real estate investments and etc. (Asaul, Karasev 2001; McKenzie *et al.* 2010; Galinienė 2015).

The price of a construction project can strongly change over time; one of the main reasons is a speculative nature of real estate market. The real estate market is able to accumulate large amounts of money over a relatively short period of time, thereby breaking balance between the flow of goods and money (Ling, Archer 2012).

If to speak about real property value for its potential consumer, in most cases during its development it will increase, though it is necessary not to rule out the possibility of changing needs of the market participants, therefore new real property value can decrease in comparison with the previous one. The cost of a construction project also depends on the cyclical phase of real estate market. In this regard it is necessary to pay special attention to decision-making on development and choice of the specific capital investment project (Geipele, Kauškale 2013).

The choice of the capital investment project is influenced by physical opportunity, legal permissibility, financial viability and availability, and economic efficiency (Maksimov 2003). Financial and economic viability is the main aim of the majority of projects. The preliminary analysis of the market and its cycle phases in perspective is of particular importance for successful development (Geipele, Kauškale 2013).

As a whole, the characteristics of real estate market are defined by Asaul and Karasev (2001) and McKenzie *et al.* (2010):

- imbalance of supply and demand (supply of commodities on real estate market cannot quickly respond to change in demand);
- cyclical nature of real estate market;
- high degree of state regulation;
- increase in real property value with the course of time;
- low liquidity;
- limited number of sellers and buyers;
- low level of researches;
- high level of transaction expenses.

In economics construction and real estate markets are considered as perfect examples of imperfect competition (see Table 1.1).

Real estate assets and markets are unique when compared to other goods. The two primary characteristics of real estate assets are their heterogeneity and immobility. Because of these two factors, the market for buying, selling, and leasing real estate tends to be localized and highly segmented, with privately negotiated transactions and high transaction costs (Ling, Archer 2012).

Real estate tends to be *heterogeneous* – each property has unique features. Age, building design, and especially location combine to give each property distinctive characteristics (Raslanas 2004). Even in residential neighbourhoods with very similar houses, the locations differ. Corner lots have different locational features than interior lots; their access to parks and transportation routes may differ, and the traffic patterns within the neighbourhood create differences. The most influential site and structural attributes of a home are typically observable and amenable to valuation (e.g., pools, bedrooms, and garages). However, information about a property's location attributes is much more difficult to observe and value because numerous external effects (positive and negative) act upon a land parcel at a given location, and these effects are reflected in the parcel's value (Ling, Archer 2012).

Table 1.1. Perfect markets vs. typical construction and real estate markets

Feature	Perfect market	Construction and real estate market
Number of buyers and sellers	<ul style="list-style-type: none"> – Many buyers and sellers; – No monopoly, oligopoly, or monopolistic competition. 	<ul style="list-style-type: none"> – Few participants; – Seller controls during a “seller’s market” and buyer controls during a “buyer’s market”.
Free entry and exit	<ul style="list-style-type: none"> – Free entry and exit to and from the market. 	<ul style="list-style-type: none"> – Sometimes high financial barriers to enter the market; – Long time for finding contracts and creating reputation.

Feature	Perfect market	Construction and real estate market
Product knowledge and market exchange	<ul style="list-style-type: none"> – Buyers and sellers are highly knowledgeable; – The exchange takes place with ease. 	<ul style="list-style-type: none"> – Buyers and sellers are not always knowledgeable; – The exchange is legalistic, complex and expensive.
Product and service homogeneity	<ul style="list-style-type: none"> – The product or service offered by each firm is identical to the product or service offered by other firm. 	<ul style="list-style-type: none"> – All projects are unique, no two are exactly alike; – Product (service) not homogeneous.
Mobility	<ul style="list-style-type: none"> – Products can be transported to capitalize on more lucrative markets. 	<ul style="list-style-type: none"> – The location is fixed; – A building cannot be moved to other, more profitable place.
Size and frequency of purchase	<ul style="list-style-type: none"> – The item purchased is small and relatively inexpensive; – It is purchased frequently. 	<ul style="list-style-type: none"> – Real estate and construction services are purchased infrequently; – Investments are relatively high.
Government's role	<ul style="list-style-type: none"> – Government plays little, if any, role. 	<ul style="list-style-type: none"> – Government plays a dominant role in encouraging or discouraging construction development through the use of fiscal and monetary tools and other controls: zoning, environmental and health codes, etc.
Prices	<ul style="list-style-type: none"> – Prices are established by the smooth action of supply and demand. 	<ul style="list-style-type: none"> – Prices are influenced by the interaction of supply and demand, but this interaction is not smooth; – A lack of knowledge by either of buyer or seller can distort the prices.

Real estate is immobile. Although it is sometimes physically possible to move a building from one location to another, this is generally not financially feasible. The vast majority of structures removed from the land are demolished rather than moved.

Real estate markets usually are **localized**. Potential users of a property, and competing sites, generally lie within a short distance of each other. For example, competing apartment properties may lie within 15 minutes, or less, in driving time from each other, while competing properties of single-family residences may tend to be within a single elementary school district or even within a small number of similar subdivisions (Ling, Archer 2012).

Real estate markets tend to be **highly segmented** due to the heterogeneous nature of the products (Galiniené 2015). Households that search for single-family

detached units in the market will generally not consider other residential product types such as an attached townhouse unit or condominium. In addition, real estate is segmented by product price. The same holds true, although to a lesser extent, in the commercial property market. Commercial property markets are segmented by both users and investors. Larger, more valuable commercial properties are often referred to as investment-grade properties, or institutional-grade real estate. This is the segment of the property market targeted by institutional investors such as pension funds and foreign investors. Individual private investors do not typically compete directly with institutional investors for properties (Ling, Archer 2012).

The localized nature of real estate markets also contributes to segmentation and explains why rents and prices for otherwise similar property can vary significantly across metropolitan markets and even submarkets within a given metropolitan area.

Transactions involving directly held real estate generally are privately negotiated between the buyer and seller. The negotiation process can be lengthy, and the final transaction price and other important details such as lease terms are not usually observable. Because real estate assets are highly heterogeneous and transaction details are not widely available, the time and effort involved in searching, pricing, and evaluating alternative properties is substantial. Transaction costs include both search costs (e.g., time) and actual costs. Thus, the transaction costs involved in the transfer of directly owned real estate from one owner to another are high compared to many other goods and investments. In addition, real estate agents, mortgage brokers, attorneys, and others may be involved in the transaction due to the considerable value of the investment. These services tend to increase transaction costs (Ling, Archer 2012).

At any point in time, the real estate market may not be at demand-supply equilibrium because of frequent exogenous shocks and a number of inefficiencies that prevent demand, supply, and rents or prices to adjust quickly to these shocks. These market inefficiencies include (Harvard University 2015):

- Lack of information: real estate is highly heterogeneous in terms of both quality and locational attributes. Thus, timely market and project-specific information required for the evaluation of specific transactions is rarely readily available and its collection is rather costly and time consuming. These information inefficiencies force tenants and buyers to engage in lengthy searches and prevent quick adjustment of demand to price changes.
- Construction lags: construction lags that last from several months to several years, depending on property type, prevent speedy adjustment of supply to demand and price changes.
- Long-term leases: long-term leases, with terms ranging mostly from 3 to 10 years, prevent speedy adjustment of existing rates (not rates associated

with new lease transactions) to changes in supply and demand, and hamper timely adjustments of space consumption to changes in market rates (as reflected in the latest lease transactions).

These inefficiencies characterise all property types, but at varying degrees. For example, information inefficiencies are more severe in the retail and apartment market, construction lags are longer in the office and retail market, and lease contracts are much shorter in the case of apartments.

1.3. Construction and Real Estate Market Cycles

Economic cycle (also called business cycle, trade cycle) can be defined as periodic fluctuation of the level of business activity. There are the short business cycle (*Kitchin cycle*), the medium-term business cycle (*Juglar cycle*) and the long economic cycle (*Kondratiev wave*), and also *Forrester's cycles*, *Toffler's waves*, among others. The cycles differ in duration, intensity and other factors.

The cycles of real estate market are interrelated with economic cycles, but at the same time the cycles of real estate market outrun economic cycles (see Fig. 1.4).

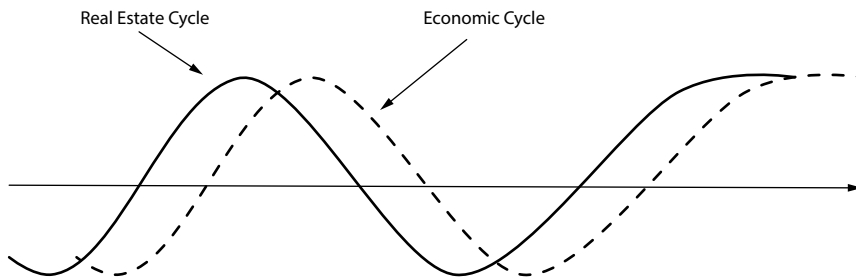


Fig. 1.4. Interrelation between economic and real estate cycles (created by authors basing on Asaul, Karasev 2001)

Construction and real estate cycles can be divided into four typical stages (see Fig. 1.5). Cycle consists of short-run cumulative and reversible movements characterized by periods of expansion and contraction and lasting three to four years (McKenzie *et al.* 2010).

During the *recovery and expansion* phases under influence of various factors cumulative demand gradually increases its preponderance over the increment of cumulative supply, causing an increase in the level of market prices. Expansion characterised of rapid growth of real estate market, large number of buyers, increasing number of sellers and solvency of population, increasing wage levels and employment-to-population ratio, and an increasing level of profitability of

the branch. All the above-mentioned factors encourage real estate prices to rise.

During the *expansion* period real estate market grows till reaches its *peak*. The increase in cumulative volume of real estate supply is equalized with the increase in cumulative volume of real estate demand, and growth of price level stops. The phase is characterized by a very large number of sellers and buyers, low solvency and decrease in profitability of the branch. Wage levels, employment-to-population ratio and refinancing interest rate reach the peak level. After the over-supply stage starts.

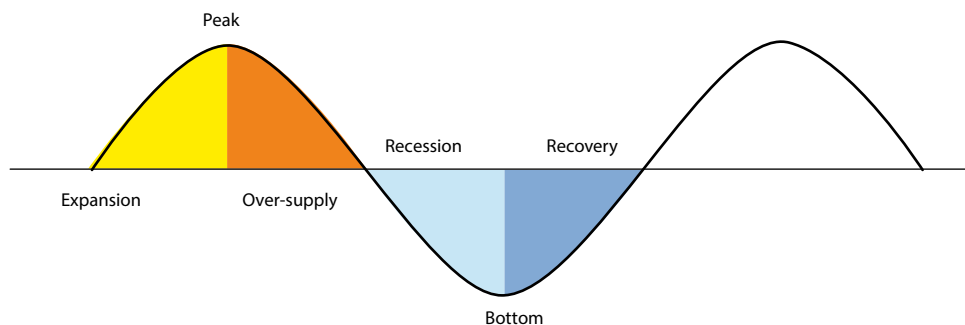


Fig. 1.5. Stages of construction and real estate market cycle

During the *slowdown* phase the number of buyers and sellers, salary and employment-to-population ratio decrease. Very low solvency is characteristic. In the phase of recession many companies of developers execute aggressive marketing campaigns and increase real estate market supply that spurs more rapid decrease in prices. The future of enterprises depends on quality of business management during recession and “the bottom” phase on real estate market. In order to define the most important preventive measures for decrease in risk and prediction of further activity of the enterprise it is necessary to pay special attention to the careful analysis of the situation on micro- and macrolevels.

Last phase is called the *recession*, the *crisis* (or “the bottom”) of real estate market. The crisis of real estate market is a certain phase of real estate market cycle when under the influence of various factors reduction in price level stops while cumulative demand and cumulative supply on real estate market are equalized. The phase is characterized by a small number of buyers and sellers, low credit standing and solvency of population, low price level and employment-to-population ratio, low profitability of the branch and low refinancing interest rate, and also a small number of real estate transactions.

Main indicators of the cycle phases are summarised in Table 1.2.

Table 1.2. Main indicators of cycle phases

Recovery Phase	Expansion Phase	Over Supply Phase	Recession Phase
<ul style="list-style-type: none"> – Decreasing Vacancy Rates – Low New Construction – Moderate Space Absorption – Low to Moderate Employment Growth – Negligible to Low Rate Rental Growth 	<ul style="list-style-type: none"> – Decreasing Vacancy Rates – Moderate/High New Construction – High Absorption – Moderate/High Employment Growth – Med/High Rate of Rental Growth 	<ul style="list-style-type: none"> – Increasing Vacancy Rates – Moderate/High New Construction – Low to Negative Absorption – Moderate to Low Employment Growth – Medium to Low Rate of Rental Growth 	<ul style="list-style-type: none"> – Increasing Vacancy Rates – Moderate to Low New Construction – Low Absorption Rate of Space – Low to Negative Employment Growth – Low to Negative Rate of Rental Growth

Real estate cycle research has linked the real estate cycle to the general macroeconomic cycle. This relationship has been recognised and documented since World War II. Early researches Grebler and Burns (1982) uncovered six residential and four non-residential construction cycles in the USA between 1950 and 1978. Pritchett's (1984) analysis indicated that the magnitudes of the construction cycles for office, industrial and retail real estate are different, with office the most volatile, industrial the least volatile and with retail somewhere in between (Dokko *et al.* 1999).

The residential construction cycles tended to be counter-cyclical, while the commercial construction cycles tended to be co-incidental with the macroeconomic cycle. The construction lag explanation, while at most partially capable of explaining moderate fluctuations in some industrial markets, is unsatisfactory, by itself, as the prime cause of cycles in other property types and thus in general. One reason is that developers must recognize the existence of lags in construction as well as their own limited abilities to forecast uncertain market fundamentals. Therefore, it is not obvious that the real estate market automatically should exhibit recurring, persistent overbuilding and under-building cycles. Furthermore, while large office construction projects in many markets have significant production lags, for other types of real estate, such as tilt-up industrial space, lags for production are brief (less than a year) (Dokko *et al.* 1999).

An alternative explanation highlights lender behaviour and nonrecourse financing as the culprits to cyclical real estate markets (Dokko *et al.* 1999). According to this view, the developer is "greedy" and if you provide nonrecourse project financing, or fees for construction, the developer will build. This argument depends on lenders making recurrent bad lending decisions, while failing to learn from prior history (i.e., past lending mistakes).

A variant of this theme attributes lender behaviour to regulatory or profitability constraints. In turn, these constraints create real estate credit availability cycles that interplay with real estate market demand cycles to cause real estate booms and busts (Dokko *et al.* 1999).

In Chinloy's (1996) cyclic real estate model, the key rental rate equation is a function of vacancies and space absorption expectations (i.e., excess supply and changes in expected excess supply). To the extent that disequilibrium occurs because of excess demand for space, the need for new space construction will be triggered. These actions move the market toward equilibrium, and generate a cycle of activity that is observed in market values and rent fluctuations over time – as the adjustment toward equilibrium continues. In Chinloy's model, the "indivisibility" of real estate space causes a "sluggish" response by the construction sector to increases in demand.

Early researches Pyhrr and Born (1994) incorporate cyclical economic factors – such as price cycles, inflation cycles, rent rate catch-up cycles and property life cycles – that impact cash flow variables and thus affect present value estimates of real estate assets. The model explains real estate value cycles as a convolution of fundamental, underlying economic, real estate supply and real estate demand cycles. The resulting model prescribes explicit incorporation of cyclical factors in appraiser cash flow models so as to produce superior present value estimates.

Other explanations apply "real option" theory to real estate cycle analysis. These approaches give more weight to the impacts of the demand-side as a cause of the cycle than do other promulgated explanations (Dokko *et al.* 1999).

Several research efforts have been devoted to examining the interrelationships among regional and economic factors and real estate market cycles. Three conclusions emerge from these studies. First, observed real estate cycles are a combination of several cycles produced by different underlying forces. Second, these forces are related to fundamental economic variables. Third, the typical real estate cycle usually follows a discernible pattern (Dokko *et al.* 1999).

The cyclical pattern from this literature can be summarised as follows. As the economic cycle declines to the trough, demand and supply forces result in an occupancy rate decline due to prior over-building and weakening subsequent demand caused by slackened economic activity. Occupancy rates are at the lowest level at the trough of the real estate cycle. Rental rates, simultaneously, are approaching the lowest point of their cycle. The rental rate cycle usually lags the occupancy rate cycle (as stated by Wheaton 1987). Furthermore, over-building and other weakened general market demand lead to financial distress, insolvency, increased mortgage delinquency and foreclosures, especially for properties that are less desirable. Lower rental income collections, perceived higher

risk and depressed future property resale price expectations are factors placing downward pressure on current market values. Frequently, in such cycles, market values decline substantially below replacement costs. Consequently, significant increases in market occupancy and rental rate levels are necessary to justify subsequent new construction. In this risky environment, the overall market cap rate and/or the discount rate for present value computations will tend to rise. Finally, lenders with substantial real estate holdings through the foreclosure process are eager to dispose of their real estate because of economic and regulatory pressures. As a likely result of financial institution sales, market values may be depressed for a substantial period of time (Dokko *et al.* 1999).

The nature of real estate performance shifts dramatically as the economic cycle turns toward its peak. As the cycle recovers and the economy, in general, becomes more buoyant, demand begins to grow, and at some point will exceed supply. The property space market has reversed itself. Occupancy rates improve as the typical first sign, followed by lagged rental rate increases. Subsequently, property market values begin to increase as real estate property net operating income (NOI) increases (because rents are rising and vacancies are falling). Real estate lenders may return to the market, providing new debt capital for an additional boost to market values (Tse *et al.* 2014).

The real estate market includes different market segments one of the most important of which is dwelling space market. The real estate market has a tendency to develop cyclically which is also the case with the dwelling space market. However, a more important aspect than cyclical development is a tendency to react to changes in the macro environment. Such changes can cause this cyclical development in the real estate market (Admidins, Zvanitajs 2011).

Cyclical fluctuations can be influenced either by one factor or a group of factors which suppress or on the contrary reinforce each other. The cyclical fluctuations in the real estate market draws attention with the fact that price fluctuations can be significantly more volatile than changes in the factors that influence these fluctuations. Prices in the real estate market have a tendency to overreact: in optimistic circumstances they tend to be noticeably higher than the optimal price while in pessimistic moments they tend to be much lower than the optimal price.

According to Admidins and Zvanitajs (2011), the optimal market price can be taken as the fundamental price or real estate replacement price which would ensure demand and supply equilibrium. In reality the real estate market cannot react fast enough to changes in demand that cause price fluctuations. Real estate market participants can not react fast enough to these changes because developing a real estate object can take years. Hence, there is no supply and demand equilibrium during this time and it is likely that insufficient supply will be replaced by overheated supply.

Many researchers of the real estate market have tried to determine the factors that influence real estate market prices, though there is not only one right answer to this question as each region has its specific features, which can affect supply and demand factors. To determine which factors will influence the real estate market in the future one can analyse the factors that have influenced real estate price fluctuations in the past. However, there is a possibility that historical factors can have little or no influence at all in the future. Possible scenarios of the real estate market development have to be considered in a context with the overall economic development as well as the fact that economics at the state level develops as one whole and changes in one of the factors to some extent will definitely affect the overall situation.

The economic and demographic factors that affect the level of demand, according to Admidins and Zvanitajs (2011), are as follows:

- Net household formation;
- Age composition of the household;
- House hold income;
- Credit conditions;
- Prices of substitute units;
- Ownership costs;
- Expectations about the future;
- Seasonality.

The real estate market is not influenced only by the factors that are connected with country's economic situation. Another very important factor which affects acquisition of real estate is the confidence and future expectations of inhabitants. Real estate is a durable and essential good at the same time, but unlike with other essential goods people buy it only when they have positive expectations about their future income. The real estate market depending on its type and value can be also a luxury good. Different real estate react differently to the macro environment but in the long run the real estate market can be influenced by the society as a whole, culture, climate and also other factors which are not directly connected with the economic environment.

According to Kaklauskas *et al.* (2011), the traditional analysis of a crisis in construction and real estate is based on economic, legal/regulatory, institutional and political aspects. The social, cultural, ethical, psychological and educational aspects of crisis management tend to receive less attention. To perform an integrated analysis of the life cycle of a crisis in construction and real estate, the cycle must be analysed in an integrated manner based on a system of criteria.

If we look from a perspective to have a sustainable development of the national economy, it is desirable to have prices in the real estate market close to their fundamental values. Too high volatility can lead to bankruptcy of some households or increase the probability of insolvency. However, real estate market

investors earn from these price fluctuations, hence high volatility ensures good profitability. All stakeholders in the real estate market benefit or on the contrary are made worse off from these price fluctuations, thus they all will be interested to know how the sector will possibly develop (Admidins, Zvanitajs 2011).

1.4. Theories and Evidences of Prices Bubbles

The definitions of “prices bubble” in detail were analysed by Siegel (2003). According to author, the word “bubble” conjures up the image of an object growing steadily until it finally pops. Charles Kindleberger, professor emeritus at the Massachusetts Institute of Technology and author of the popular book *Manias, Panics, and Crashes: a History of Financial Crises* defined a bubble as “an upward price movement over an extended range that then implodes” (Kindleberger 2003).

In the New Palgrave: a Dictionary of Economics, Kindleberger was more specific: “A bubble may be defined loosely as a sharp rise in the price of an asset or a range of assets in a continuous process, with the initial rise generating expectations of further rises and attracting new buyers –generally speculators interested in profits from trading in the asset rather than its use or earnings capacity”.

This definition implies that a high and growing price is unjustified (not related to “earnings capacity”) and is fed by “momentum” investors who buy with the sole purpose of selling quickly to other investors at a higher price (Siegel 2003).

Economists have tried to give additional substance to the definition of a bubble by linking asset price movements to “fundamentals”. Fundamentals refer to those economic factors such as cash flows and discount rates that together determine the price of any asset (Siegel 2003).

Peter Garber, in his book *Famous First Bubbles* indicates: “The definition of bubble most often used in economic research is that part of asset price movement that is unexplainable based on what we call fundamentals” (Garber 2000).

According to Rosser (2000), a speculative bubble exists when the price of something does not equal its market fundamentals for some period of time for reasons other than random shocks. He indicates that fundamentals should reflect an expected value of the long run equilibrium but allows “random shocks” to influence the price in the short-run. He also admits that this equilibrium is frequently unobservable.

Financial crises often follow what appear to be bubbles in asset prices. Historic examples of this type of crisis are the Dutch Tulipmania, the South Sea bubble in England, the Mississippi bubble in France and the Great Crash of 1929 in the United States. A more recent example is the dramatic rise in real estate and stock prices that occurred in Japan in the late 1980’s and their subsequent collapse in 1990. Norway, Finland and Sweden had similar experiences in the 1980’s and early 1990’s. In emerging economies financial crises of this type have

been particularly prevalent since 1980. Examples include Argentina, Chile, Indonesia, Mexico, and more recently the South East Asian economies of Malaysia, Indonesia, Thailand and South Korea (Allen, Gale 2000).

Explaining a bubble is, according to the arguments above, a type of historical explanation, focusing on the interaction of a number of factors and the interaction of individuals with different degrees of knowledge, different beliefs and plans – and with various incentives to take certain things into account. Even if each bubble episode has unique features it might be possible to construct a smaller number of “ideal types” of bubbles, where some specific mechanism dominates. Three types of “ideal bubbles” were distinguished by Lind (2008) (see Table 1.3).

Three main characterisations of bubbles have been discussed in the literature (momentum, explosive and intrinsic) (Black *et al.* 2006). Momentum investor behaviour is driven by price alone, whereby agents buy after price increases and sell after price decreases (Barberis *et al.* 1998). Such momentum occurs when a price rise (fall) is expected to continue to rise (fall). This type of bubble is usually taken as evidence against rationality of the marketplace.

Table 1.3. Types of “ideal bubbles” (created by authors, basing on Lind 2008)

Type	Explanation
A pure speculative bubble	Buyers believe that the price of the asset today is too high and that the price eventually will fall, but believe that the price will continue to rise for some time, and that it will be possible to sell with a profit before the price falls.
An irrational expectations bubble	Actors on the market become overoptimistic and think that asset price will grow rapidly over a longer period of time. The growth is expected to be considerably higher than historical averages. Therefore it seems rational to pay a high price today.
The irrational institutions bubble	The buyer of the house/apartment does not expect to take the losses that occur when prices fall dramatically. The person who lends to money also expects to be able to shift the losses to someone else, maybe the government in the end. The sub-prime lending is the latest example of this.

In contrast, the two other types of bubbles constitute evidence of rationality. With an explosive rational bubble, prices deviate from fundamentals due to factors extraneous to asset value. Such bubbles continuously diverge and cannot be negative since this would imply a negative asset value (Diba, Grossman 1988). Intrinsic rational bubbles derive all of their variability from exogenous fundamentals rather than from extraneous factors. Unlike explosive bubbles, intrinsic bubbles do not continuously diverge but periodically revert toward their fundamental value (Lind 2008).

Findings of Black *et al.* (2006) prove the existence of an explosive rational bubble due to non-fundamental factors as being the driving force of deviations from fundamental value. Intrinsic bubbles have an important role to play in determining actual house prices although price dynamics appear to impact, particularly in periods of strong deviation from fundamental value.

Allen and Gale (2000) distinguish three distinct phases of prices bubbles. The first phase starts with financial liberalisation or a conscious decision by the central bank to increase lending or some other similar event. The resulting expansion in credit is accompanied by an increase in the prices for assets such as real estate and stocks. This rise in prices continues for some time, possibly several years, as the bubble inflates. During the second phase the bubble bursts and asset prices collapse, often in a short period of time such as a few days or months, but sometimes over a longer period. The third phase is characterised by the default of many firms and other agents that have borrowed to buy assets at inflated prices. Banking and/or foreign exchange crises may follow this wave of defaults. The difficulties associated with the defaults and banking and foreign exchange crises often cause problems in the real sector of the economy which can last for a number of years. Some examples of prices bubbles are provided below.

The Japanese bubble in the real estate and stock markets that occurred in the 1980's and 1990's provides is an example of this phenomenon. Financial liberalisation throughout the 1980's and the desire to support the United States dollar in the latter part of the decade led to an expansion in credit. During most of the 1980's asset prices rose steadily, eventually reaching very high levels. For example, the Nikkei 225 index was around 10,000 in 1985. On December 19, 1989 it reached a peak of 38,916. A new Governor of the Bank of Japan, less concerned with supporting the US dollar and more concerned with fighting inflation, tightened monetary policy and this led to a sharp increase in interest rates in early 1990. The bubble burst. The Nikkei 225 fell sharply during the first part of the year and by October 1, 1990 it had sunk to 20,222. Real estate prices followed a similar pattern. The next few years were marked by defaults and retrenchment in the financial system. The real economy was adversely affected by the aftermath of the bubble and growth rates during the 1990's have mostly been slightly positive or negative, in contrast to most of the post war period when they were much higher (Allen, Gale 2000).

Norway, Finland and Sweden also experienced this type of bubble. Heiskanen (1993) found that in Norway lending increased by 40% in 1985 and 1986. Asset prices soared while investment and consumption also increased significantly. The collapse in oil prices helped burst the bubble and caused the most severe banking crisis and recession since the war. In Finland an expansionary budget in 1987 resulted in massive credit expansion. Housing prices rose by a total of 68% in 1987 and 1988. In 1989 the central bank increased interest rates and

imposed reserve requirements to moderate credit expansion. In 1990 and 1991 the economic situation was exacerbated by a fall in trade with the Soviet Union. Asset prices collapsed, banks had to be supported by the government and GDP shrank by 7%. In Sweden a steady credit expansion through the late 1980's led to a property boom. In the fall of 1990 credit was tightened and interest rates rose. In 1991 a number of banks had severe difficulties because of lending based on inflated asset values. The government had to intervene and a severe recession followed (Allen, Gale 2000).

The persistence of the present boom in international property prices is unparalleled in recent times. Over the five year period 2000–2005, estimates by *The Economist* (Buttonwood 2010) reveal that the value of residential property in developed countries rose by over 30 trillion dollars – an increase equivalent to 100% of those countries combined GDPs. In North America and across Europe, countries have experienced record highs in terms of house price to income ratios (McQuinn, O'Reilly 2008).

Richmond (2007) investigated changes in house prices for both the UK and Ireland. He concluded that prices in the UK/London have reached a tipping point and relative to inflation are set to fall over the next few years. House prices (again relative to inflation) in Ireland are shown to have broken away from the more moderate rises found in the provinces of mainland UK, and Dublin seems to have emerged as another global “hot spot”. An evolution similar to that in London can be anticipated.

The financial times of 7 May 2006 carried on the front page the headline: ‘Property Bonanza in Central London’ and noted that “a mini-boom is sweeping the most exclusive streets of London where house prices have risen by 14.5% in a year”. On a different page of the same newspaper there was a rather more cautionary announcement: repossession orders were now at their highest level since the previous peak that occurred as property prices were falling in the early 1990s (Richmond 2007).

Recently the UK market faced a further problem relating to the supply of finance. Prior to the financial crash borrowers were able to finance up to 95% (and sometimes more) of the purchase price using mortgage debt. Post-crash, banks withdrew the majority of these offers and many increased the required down-payment to around 25% compared to a historical average of 10% (Tse *et al.* 2014).

Even if credit eventually becomes more readily available the housing market appears unlikely to return to pre-crisis levels. The UK Financial Services Authority (FSA) introduced proposals to place greater formal restrictions on mortgage lending. The Council of Mortgage lenders suggested in 2011 that implementation of these proposed restrictions could see four million less mortgages in the UK (halving of the total number) over the subsequent 4 years (Tse *et al.* 2014).

In Dublin house prices that have risen slowly for many decades have been rising very quickly since 1997. One commentator reported that “Frenzy in the Irish property market has intensified. In the last six months, house price inflation has accelerated to an annual rate of 15%. In Dublin, prices are rising at an annual rate of 20%, up from only 3% less than a year ago. But rents have only recently recovered after a three-year period in which they were in decline. As a result, yields have been driven down to unprecedented depths” (White 2006).

Roehner (2006) has made an empirical study of house price peaks looking at bubbles that have occurred in the past. Implementing an approach based on work by Johansen *et al.* (1999), he has noted, using examples from different times and different parts of the globe, that speculative bubbles exhibit certain regularities in shape.

Towards the end of the first decade of the XXI century, Spain, just like many countries around the world went through a severe financial crisis, preceded by a bubble on the real estate market and turmoil on the credit market (Karaś 2014). The nominal interest rates on new mortgage loans reached as low levels as 3–4% in the years 2003–2005, which represented a radical decline from about 15% in early 1990, while the average maturity of mortgage loans in Spain increased from 10 to 28 years between 1990 and 2007 (Garcia-Herrero, de Lis 2008; Garriga 2010). The property prices multiplied by over 2 from the mid-1990s to 2004 and by 3 in the period 1995–2007. These multipliers for the whole euro area altogether are significantly lower: 1.5 and 1.8, respectively – the increase in property prices in Spain was significantly higher than, for example, in the United States. In fact, the cumulative growth of house prices in Spain was among the highest in the OECD (Garriga 2010; Salmon 2010). As research shows (e.g. see Caruana 2005), property prices’ increase in Spain was far beyond the long-term equilibrium, which makes it fulfil the criteria for a bubble (Gallin 2003; Karaś 2014).

The bubble which appeared on the Spanish real estate market in the early 2000s was influenced by a number of factors on the demand (demography, immigration, cultural factors, fiscal policy related to housing, credit market structure and regulations), supply (land regulations, immigration), and monetary policy side (Karaś 2014).

Slowdown on the Spanish real estate market started at the beginning of 2007 and intensified after the burst of the asset bubble in the United States in the summer of the same year. Garcia-Herrero and de Lis (2008) mentioned two important channels of contagion from the US to the rest of the world (Karaś 2014):

- funding liquidity dry-up and the closure of the wholesale money markets;
- direct exposure to subprime losses (negligible in the case of Spain, where subprime credits were not granted on a large scale and banks had not looked for investment opportunities abroad).

As a consequence, in February 2007, the number of new house mortgages granted in Spain was down by nearly 4%, in May – by 6%, and in October – by 12%, compared to the previous year. The pace of decline accelerated in 2008, with a 29% drop in May 2008 compared to May 2006, and a 42% decline in October 2008 compared to October 2006. In January 2009, the sum of mortgages granted fell by 58% from the equivalent number in January 2007 – and then stabilized (Salmon 2010).

As a consequence of the liquidity crisis, decrease in lending, fall in the value of the banks' assets (both real estate and equity holdings), and increased level of bad debts, the central bank had to intervene to support banks (Karaś 2014).

In Spain *cajas* (“credit institutions with foundational origins and social objectives” with public representation in their governing bodies) made up a half of the banking system. As the crisis hit, the Bank of Spain had to support two of them: it provided Caja de Ahorros de Castilla-La Mancha with temporary liquidity support in early 2009 and took into administration the Córdoba based ‘CajaSur’ in mid-2010. On the other hand, the soundest bank in the EU according to stress tests organized by the Committee of European Banking Supervisors (CEBS, now the European Banking Authority) in July 2010 was the Spanish Banca March (CEBS 2010).

Given examples of prices bubbles suggest that there are particular indicators of bubbles. These should be discussed in more detail.

1.5. Indicators of Real Estate Prices Bubbles

Figure 1.6 gives an overview of the different dimensions that need to be analysed in order to find a sufficient condition for a specific bubble. In each dimensions there could be necessary conditions for the bubble, e.g. if there were no boom in the economy there would not have been any bubble, if incentives had been different then there might not have been a bubble, etc. Lind (2008) distinguishes and explains the main indicators of prices bubble to appear.

Prices and incomes. One common indicator is the price/income ratio. Argument for using this indicator can be found in the empirical material presented in Case and Shiller (2003) where it is shown that this relation has been very stable over time in a number of regions. It is also shown that in a number of states in the USA where the relation increased it later fell back towards an historical average.

Also, there are several arguments against using the price/income ratio as a bubble indicator (e.g. McCarthy, Peach 2004; Himmelberg *et al.* 2005). The first is that households care about the relation between housing expenditure and incomes, not the relation between price and income. Another, and according to

my view, stronger argument against using the price/income ratio is that even in the fastest growing countries or regions, incomes do not grow more than around 10% per year. This means that any period with a dramatic rise in prices would be characterized by an increased price to income ratio, and the ratio would therefore not make it possible to distinguish periods where prices increase because of a structural shift or by factors that will not last (Lind 2008).

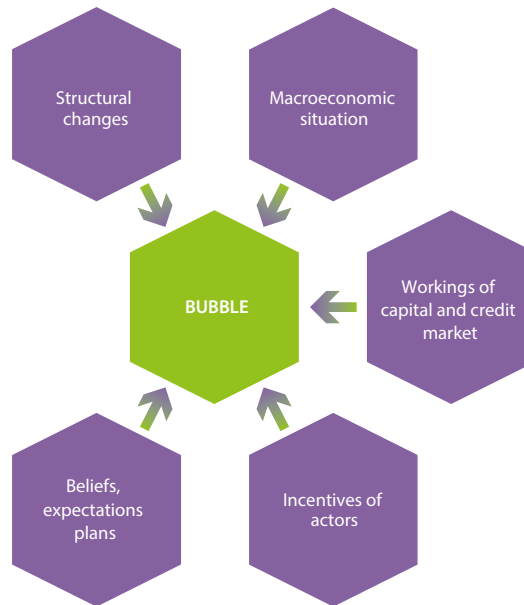


Fig. 1.6. Factors that explain real estate bubbles

Housing expenditure. The direct expenditure should be analysed (Lind 2008). Interest costs are a large part of the housing expenditure and a possible indicator is the relation between the nominal interest payments of the average buyer and their income. If this is significantly higher than in earlier periods, it would indicate that the buyers are acting in a non-sustainable way.

Some economists have argued that falling nominal interest rates is a fundamental that can explain the observed price increases (e.g. McCarthy, Peach 2004; Golob *et al.* 2012), but there have been several criticisms of the use of nominal interest rates in this type of calculation (see e.g. Economist 2005; Shiller 2007a,b). The core of their argument is that if nominal interest rates fall because of lower inflation, then this would not motivate paying more for a house. Shiller (2007a) argues that the weight given to nominal interest rates should be seen as a change in “popular models” and reflects money illusion. This argument would then instead lead to a focus on the real (after tax) interest payments for buyers. It is also necessary to clarify which nominal and real interest rate that should

be used. The background to this question is the argument that homebuyers are thinking too much about the current interest rate and that they (irrationally?) think that a current (low) nominal interest rate will last (Lind 2008).

Housing supply. If, for example, falling interest rates were analysed from the perspective of a standard stock flow model, the argument would go like the following (Lind 2008):

- 1) Falling interest rates would lead to increasing demand for housing;
- 2) In the short run with given supply, this leads to higher prices;
- 3) The higher prices lead to increased profitability in housing construction and increased supply;
- 4) The prices fall to a level that is determined by the level of construction costs.

The supply side has been mentioned in the recent debates about bubbles, by e.g. Quigley (2003) and Goodman and Thibodeau (2008). They argue that a price increase caused by e.g. falling interest rates and increasing GDP is not a bubble, if it is very difficult to increase supply. The logic of this reasoning is clear from the stock-flow model. These arguments indicate that a bubble sub-indicator should focus on how difficult it is to increase supply in the areas where prices increase much.

Glaeser *et al.* (2008) presented a simple model of housing bubbles that predicts that places with more elastic housing supply have fewer and shorter bubbles, with smaller price increases in the USA. The data showed that the price run-ups of the 1980s were almost exclusively experienced in cities where housing supply is more inelastic. More elastic places had slightly larger increases in building during that period. Over the past five years, a modest number of more elastic places also experienced large price booms, but as the model suggests, these booms seem to have been quite short. Prices are already moving back towards construction costs in those areas.

Buyer expectations about prices. Case and Shiller (2003) note that a sign of a bubble is that people expect increasing house prices even though prices already have increased a lot.

Expectations about future prices can be formed in a number of ways. Beside the efficient market assumptions, people might build their expectations on longer or shorter historical trends, or on assumptions about mean reversion: that the probability of falling prices increases when prices have gone up a number of years. Many actors on the market believe that prices will continue to increase as they did in recent years, and when prices has increased a lot people still do not believe that they will fall, but will stabilize on a level that is very high from an historical perspective (Wong, Hui 2006; Lind 2008).

Buyer impatience and financial risk taking. The first idea here is that the probability of falling prices would be higher if, during a period with rising

prices, households become more impatient: the cost of waiting is felt to be high, which might be related to herd behaviour, if it is felt that many others have “realized their dreams” and e.g. bought a house or apartment that is expensive in relation to their income (Lind 2008).

The second aspect of this is that the risk for falling prices would be higher if households choose more risky financing alternatives. An extreme case is the kind of loan that led to the sub-prime crises in the USA, where interest payments and amortization were reduced the first years. A less extreme case is where a large part of the loan has interest rates that follow the current market rent and that these loans are taken during a period where the short run interest is low (Lind 2008).

A third aspect, according to Lind (2008) of increased risk taking would be if the rate of amortization is low for home buyers compared to historical averages. As amortization is a way to build up reserves, a low rate of amortization means increased risk taking.

The credit market. More risky financing choices by the households presuppose that there is a supply of such lending. Kindleberger (2003) underlines that bubbles on the asset markets are affected by easy credit.

When the focus is on the housing market, easy lending should firstly be reflected in the loan to-value ratios. From a mean-reversion perspective, loan to value ratios should be reduced during an extreme boom, but if loan-to-value ratios even increase (everything else equal) then that should be an indicator of too easy lending. Another aspect is how the banks evaluate the borrowers' credit worthiness and whether there is a change in a more liberal direction (Lind 2008).

The role of interest rates as a primary determinant of house price movements is virtually uncontested. However, economic models of house prices have struggled to successfully “incorporate” the effects of interest rate movements (Tupénaitė, Kanapeckienė 2009; Golob *et al.* 2012). The house price demand schedule can be adequately represented by the average amount borrowed, which is determined on the basis of prevailing disposable income levels and interest rates.

Speculative behaviour. When housing prices are increasing rather quickly and if there are strong expectations of future price increases, then some people might see an opportunity for quick profits by buying an apartment or house and selling it again rather soon. This speculative behaviour might then further increase demand and prices. In many historical asset market bubbles this type of behaviour has been observed, even if it cannot be expected to be central on the housing market where transaction costs are high (Lind 2008; Tupénaitė, Kanapeckienė 2009).

Different mathematical models were used in order to prove an existence of real estate bubbles in many countries. Some of the findings are discussed in more detail.

The cause of the “housing bubble” associated with the sharp rise and then drop in home prices over the period 1998–2008 has been the focus of significant policy and research attention in the USA. The dramatic increase in subprime lending during this period has been broadly blamed for these market dynamics. Coleman V *et al.* (2008) empirically investigated the validity of this hypothesis vs. several other alternative explanations. A model of house price dynamics over the period 1998–2006 was specified and estimated using a cross-sectional time-series data base across 20 metropolitan areas in the USA over the period 1998–2006. Results suggested that prior to early 2004; economic fundamentals provided the primary explanation for house price dynamics. Subprime credit activity did not seem to have had much impact on subsequent house price returns at any time during the observation period, although there is strong evidence of a price-boosting effect by investor loans. Market fundamentals became insignificant in affecting house price returns, and the price-momentum conditions characteristic of a “bubble” was created. Authors coming to conclusion that rather than causing the run-up in house prices, the subprime market may well have been a joint product, along with house price increases, (i.e., the “tail”) of the changing institutional, political, and regulatory environment characteristic of the period after late 2003 (the “dog”).

Publishers, Wiley-Blackwell (2006) investigated the hypothesis that there was a bubble in British house prices. Authors used a new dynamic panel data model of British regional house prices between 1972 and 2003. The model included a full range of explanatory variables. When the model used data up to 1996 and forecasted forward to 2003, authors did not find any symptoms of systematic under-prediction of house prices. Accordingly they concluded that there was little evidence of a house price bubble and the strong growth in house prices in this period can be largely explained by the combination of strong income growth, higher population growth (partly from immigration), lower interest rates and low rates of house-building. Authors also simulated house price developments for the period 2004–2010 on a range of assumptions about income growth, population growth, house building, inflation and interest rates. They found that only quite negative scenarios would produce falls in nominal house prices.

Summary of factors that affect real estate market fluctuations, provided in studies of various authors, is presented in Table 1.4.

Reviewing studies of cross-country property markets reveals some agreement in identifying the underlying determinants of the demand and supply of housing. Two of the key drivers frequently cited in the recent run up in house prices have been rising income levels and the benign interest rate environment faced by many countries (McQuinn, O'Reilly 2008).

Table 1.4. Factors that affect real estate market fluctuations

Author	Factors
Bjöklund and Söderberg (1999)	Fundamental factors: income, revenue growth and return on investment. Other factors, such as loan interest rate, unemployment rate, GDP are fundamental factors.
de La Paz (2003)	Urban growth, wages, GDP, the limited supply of properties.
Chen <i>et al.</i> (2004)	Macroeconomic factors: GDP, inflation, etc.
Craig Hall (2004)	National factors: interest rates, inflation and investment flows. Regional factors: unemployment, migration, progress in the new building. Irrational factors: expectations, the information in the media.
Raslanas (2004)	Macroeconomic factors: the economic situation in the country, the credit policy. The main individual house price determinants: housing location and condition.
EEA (2004)	The presence of polluting industries, social factors, unemployment, capital markets influence, population and household growth, infrastructure, tourism development, land and other fees, the distance to the coastal economic growth, land-use planning and other restrictions, housing stocks, and population density inflation, distance to the city centre.
Galinienė <i>et al.</i> (2006, 2015)	The economic situation in the country, the cost of construction, the new building, expectations, housing affordability.
Vanichvatana (2007)	Macro-environmental factors (GDP, employment, interest rates and foreign exchange rates, stock indices, geographical factors: population, its age). Micro-environmental factors: the number of permits issued, new buildings, construction cost indices, etc.
Tupėnaitė and Kanapeckienė (2009)	Fundamental economic factors: GDP, inflation, wages, unemployment. Basic construction market factors: housing supply shortage and price increase of construction. The housing credit policy. Irrational market factors: population expectations and speculation in the real estate market.
Azbainis, Rudzkiene (2011)	Rational and irrational factors: bank loans granted to clients, number of available dwellings, consumer confidence, the average interest rate on loans, average price of precast bedroom apartment, annual real GDP growth, and average annual inflation.

1.6. Measures to Manage Real Estate Booms and Busts

1.6.1. Policy Effects on Real Estate Markets

Real estate boom-bust cycles can have far-reaching consequences. These booms are generally accompanied by fast credit growth and sharp increases in leverage, and when the bust comes, debt overhang and deleveraging spirals can threaten financial and macroeconomic stability (Crowe *et al.* 2012).

Despite the significance of this problem, the traditional policy approach to real estate booms has been one of “benign neglect” (Bernanke 2002; Greenspan 2002), notwithstanding the more proactive approach adopted by a few central banks (Mishkin 2011). This was based on two main premises.

First, the belief that, as for other asset prices, it is extremely difficult to identify unsustainable real estate booms, or “bubbles” (sharp price increases not justified by fundamentals), in a timely manner. Second, the notion that the distortions associated with preventing a boom outweigh the costs of cleaning up after a bust. The crisis has challenged (at least the second of) these assumptions (Crowe *et al.* 2012).

The burst of the real estate bubble in the United States triggered the deepest recession since the Great Depression, which quickly spread to other countries; in particular those with their own home-grown bubbles. Traditional macroeconomic policy rapidly reached its limits, as monetary policy rates approached the zero bound and sustainability concerns emerged on the fiscal front. And despite the recourse to extraordinary measures (ranging from bank recapitalization to asset purchase programs and quantitative easing), the aftermath of the crisis has been characterized by a weak recovery, as debt overhang and financial sector weakness continue to hamper economic growth. Bubbles remain hard to spot with certainty. But this task can be made easier by narrowing the focus to episodes involving sharp increases in credit and leverage, which are, after all, the true source of vulnerabilities. While early intervention may engender its own distortions, it may be best to undertake policy action on the basis of a judgment call (as with inflation) if there is a real risk that inaction could result in catastrophe (Crowe *et al.* 2012).

Before the crisis, the main policy tenet in dealing with an asset price boom was that it was better to wait for the bust and pick up the pieces than to attempt to prevent the boom *ex-ante* (admittedly, this was less true in emerging market economies, which often paid close attention to real estate markets). Given this prescription, the characteristics of a particular asset class (such as how purchases are financed and what agents are involved, or whether the asset has consumption value besides investment value) were secondary details. Yet, if post-bust policy intervention is of limited effectiveness and, thus, the costs associated with

a bust are large, these details are critical to determine whether it is worth attempting to contain a boom in the first place. From this standpoint, several frictions and externalities make the case for early policy intervention in real estate market booms stronger than for booms in other asset classes (Crowe *et al.* 2012).

Leverage and the link to crises. From a macroeconomic stability perspective, what matters may be not the boom in itself, but how it is funded. Busts tend to be more costly when booms are financed through credit and leveraged institutions are directly involved. This is because the balance sheets of borrowers (and lenders) deteriorate sharply when asset prices fall (Tse *et al.* 2014).

When banks are involved, this can lead to a credit crunch with negative consequences for real economic activity. In contrast, booms with limited leverage and bank involvement tend to deflate without major economic disruptions. For example, the burst of the dot-com bubble was followed by a relatively mild recession, reflecting the minor role played by leverage and bank credit in funding the boom.

According to Crowe *et al.* (2012), real estate markets are special along both these dimensions. The vast majority of home purchases and commercial real estate transactions in advanced economies involve borrowing. And banks and other levered players are actively involved in the financing. Moreover, homebuyers are allowed leverage ratios orders of magnitude higher than for any other investment activity. A typical mortgage loan carries a loan-to-value ratio of 71% on average across a global sample of countries. In contrast, stock market participation by individuals hardly ever relies on borrowed funds. And when it does, loans are subject to margin calls that prevent the build-up of highly leveraged positions.

During the current crisis, highly leveraged housing markets had a prominent role. In particular, the decline in U.S. house prices was at the root of the distress in the market for mortgage-backed securities. When house prices started to fall, both speculative buyers and owner-occupiers that were unwilling or unable to repay their mortgages could not roll them over or sell their properties and started to default (Mayer *et al.* 2008). As uncertainty about the quality of the underlying loans increased, the value of mortgage-backed securities began to decline. Investors holding these securities and their issuers, both often highly leveraged themselves, found it increasingly difficult to obtain financing and some were forced to leave the market. This, in turn, decreased the available funds for mortgage financing, starting a spiral (Crowe *et al.* 2012).

This pattern is not limited to the United States, nor is it new to this crisis. The amplitude of house price upturns prior to 2007 is statistically associated with the severity of the crisis across countries (Claessens *et al.* 2010). Put differently, the U.S. market may have been the initial trigger, but the countries that experienced the most severe downturns were those with real estate booms of their own. And,

historically, many major banking distress episodes have been associated with boom-bust cycles in property prices (Crowe *et al.* 2012).

Looking at the twelve infamous episodes, house price plunged 25% in the three-year period from their peak while real GDP dropped by 6 percentage points compared to the level when house prices were at their peak. Another distinguishing feature of “bad” real estate boom-bust episodes seems to be coincidence between the boom and the rapid increase in leverage and exposure of households and financial intermediaries. In the most recent episode, this was the case in over half the countries in a 40-country sample (Crowe *et al.* 2012).

A credit boom exists if the growth rate of bank credit to the private sector in per cent of GDP is more than the arbitrary cut-off of 20 per cent or it exceeds the rate implied by a country-specific, backward-looking, cubic time trend by more than one standard deviation. A financial crisis is a systemic banking crisis as identified in Laeven and Valencia (2010). Poor performance is defined as more than 1 percentage point decline in the real GDP growth rate in 2008–2009 compared to the 2003–2007 average (Crowe *et al.* 2012).

Almost all the countries with “twin booms” in real estate and credit markets (21 out of 23) ended up suffering from either a financial crisis or a severe drop in GDP growth rate relative to the country’s performance in the 2003–2007 period. Eleven of these countries actually suffered from both damage to the financial sector and a sharp drop in economic activity. In contrast, of the seven countries that experienced a real estate boom, but not a credit boom, only two went through a systemic crisis and these countries, on average, had relatively mild recessions (Crowe *et al.* 2012).

Wealth and supply-side effects. Real estate is an important, if not the most important, storage of wealth in the economy. Additionally, the majority of households tend to hold wealth in their homes rather than in equities. Typically, in advanced economies less than half of households own stock (directly or indirectly) while homeownership rate hovers around 65% (Guiso *et al.* 2003).

In addition, the supply-side effects associated with house price dynamics can be substantial. The construction sector, a significant contributor to value added, takes property prices as a signal and adjusts production accordingly. As a result, the interaction between real estate boom-busts and economic activity is not limited to financial crises, but extends to “normal times”. In most advanced economies, house price cycles tend to lead credit and business cycles (Igan *et al.* 2009). This suggests that fluctuations in house prices create ripples in the economy through their impact on residential investment, consumption, and credit while the reverse effect is not as prominent, implying that the housing sector can be a source of shocks, or at least there is a two way relationship between house prices and economic activity (IMF 2011). In advanced economies, recessions that coincide with a house price bust tend to be deeper and last longer than those

that do not, and their cumulative losses are three times the damage done during recessions without busts. Again, by contrast, recessions that occur around equity price busts are not significantly more severe or persistent than those that do not (Claessens *et al.* 2008) (cited from Crowe *et al.* 2012).

Illiquidity, capacity, and network effects. Boom-bust cycles are an intrinsic feature of real estate markets. This reflects delays in supply response to demand shocks and the slow pace of price discovery due to opaque and infrequent trades as well as illiquidity owing to high transaction costs and the virtual impossibility of short sales. In other words, real estate prices and construction activity can be expected to display large swings over long periods, even absent the distortions due to institutional features of real estate finance and policy actions (Igan, Loungani 2011).

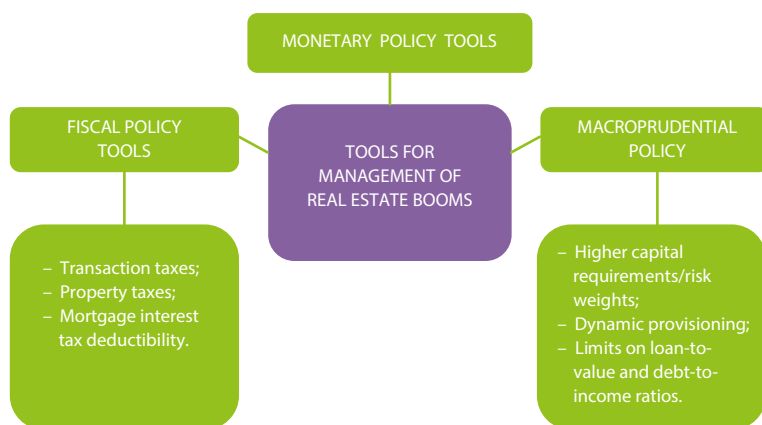


Fig. 1.7. Policy tools for management of real estate booms and busts

Homeowners in financial distress (and in particular in negative equity) have diminished incentives to maintain their properties and do not internalize the effects of this behaviour on their neighbours. Similarly, foreclosures (and the associated empty houses) tend to diminish the value of neighbouring properties beyond their effect through fire sales. The double role of real estate as investment and consumption good may reduce mobility and increase structural unemployment, as households in negative equity may be reluctant or unable to sell and take advantage of job opportunities elsewhere. The preferential tax treatment of homeownership exacerbates this problem, by creating a wedge between the cost of owning and renting. Hence, a housing bust may weaken the positive association between employment growth and mobility (Crowe *et al.* 2012).

Traditionally, monetary and fiscal policy tools are distinguished to manage particular economic problem. Indeed, as stated by Crowe *et al.* (2012), there is no silver bullet. Each policy entails costs and distortions, and its effectiveness

is limited by loopholes and implementation problems. Broad-reaching measures (such as a change in the monetary policy rate) are more difficult to circumvent, and hence potentially more effective, but typically involve greater costs. More targeted measures (such as maximum loan-to-value ratios) may limit costs, but are challenged by loopholes, jeopardizing efficacy. Possible tools to manage real estate booms and busts are provided in Figure 1.7.

1.6.2. Monetary Policy Measures

An increase in the policy rate makes borrowing more expensive and reduces the demand for loans. Besides, higher interest payments lower the affordability index (the ratio of median household income to income necessary to qualify for a typical mortgage loan) and shrink the number of borrowers that qualify for a loan of certain amount. Indirectly, to the extent that monetary tightening reduces leverage in the financial sector, it may alleviate the financial consequences of a bust even if it does not stop the boom (Adrian, Shin 2009; De Nicolo *et al.* 2010).

Yet, monetary policy is a blunt instrument for this task. First, it affects the entire economy and is likely to entail substantial costs if the boom is limited to the real estate market. Put differently, a reduction in the risk of a real estate boom-bust cycle may come at the cost of a larger output gap and the associated higher unemployment rate (and possibly an inflation rate below the desired target range). Obviously, these concerns are diminished when the boom occurs in the context (or as a consequence) of general macroeconomic overheating. Then, the distortions associated with monetary tightening would be minimized. Indeed, when financial constraints are present and real movements and/or credit growth (in addition to inflation and the output gap) can dominate a traditional Taylor rule but only for booms that occur in the context of general macroeconomic overheating (Crowe *et al.* 2012).

A second concern is that, during booms, the expected return on assets (in this case, real estate) can be much higher than what can be affected by a marginal change in the policy rate. It follows that monetary tightening may not directly affect the speculative component of demand. If that is the case, it may have the perverse effect of leading borrowers (who would have otherwise qualified for standard mortgages) towards more dangerous forms of loans (such as interest-only, variable-rate loans, and in some cases foreign-currency loans). Moreover, in the presence of free capital mobility, the effectiveness of monetary policy may be limited, especially for not-fully flexible exchange rate regimes. Finally, the effectiveness of a change in the policy rate will also depend on the structure of the mortgage market. In systems where mortgage rates depend primarily on long-term rates, the effectiveness of monetary policy will depend on the relationship between long and short rates (Crowe *et al.* 2012).

To a large extent, empirical evidence supports these concerns, leading to the bottom line that monetary policy could in principle stop a boom, but at a very high cost. At first glance, there is little evidence across countries that the pre-crisis monetary stance had much to do with the real estate boom. Inflationary pressures were broadly contained throughout the period and the extent of house price booms does not appear correlated with real interest rates or other measures of monetary conditions, except in a subsample of euro zone countries (IMF 2009).

Housing booms were indeed more salient in countries which experienced a decline in import prices relative to the general price level. But the relationship between the monetary policy stance and house prices remains weak (albeit more statistically significant) after controlling for this issue (with Taylor residuals based on domestic inflation rather than overall CPI inflation). Put differently, policymakers would have to “lean against the wind” dramatically to have a meaningful impact on real estate prices and credit, with large effects on output and inflation. This intuition is confirmed by a panel vector autoregression, which suggests that, at a 5-year horizon, a 100 basis point hike in the policy rate would reduce house price appreciation by only 1 percentage point, compared to a historical average of 5% increase per year (see Crowe *et al.* 2011, for details). But it would also lead to a decline in GDP growth of 0.3 percentage points (Crowe *et al.* 2012).

Part of the problem may be that speculation is unlikely to be stemmed by changes in the monetary policy stance. Indeed, there is some evidence that conditions in the more speculative segment of mortgage markets are little affected by changes in the policy rate. For example, in the United States, denial rates (calculated as the proportion of loans originated to applications received) in the market for prime mortgages appear highly related to changes in the federal funds rate, with banks becoming choosier when the rate increases. In contrast, denial rates for subprime loans (typically more linked to speculative purchases) do not seem to move systematically with monetary policy (Crowe *et al.* 2011).

1.6.3. Fiscal Policy Measures

Varieties of fiscal measures (i.e. transaction taxes, property taxes, credits, deductibility of interest payments) influence the decision to invest in real estate.

In theory, some of these fiscal tools could be adjusted in a cyclical manner to influence house price volatility, while preserving the favourable treatment of homeownership on average over the cycle. Yet, if the net present value of all future taxes are capitalized in property prices, adjusting taxes counter cyclically around the same expected mean would not affect the prices. In practice, moreover, cyclically adjusted fiscal measures may be of limited use. First, the

evidence on the relationship between the tax treatment of residential property and real estate cycles is inconclusive. Second, technical and political economy problems may complicate implementation (Crowe *et al.* 2012).

At the structural level, the tax treatment of housing does not appear to be related across countries to the amplitude of real estate cycles: during the most recent global house price boom, real house prices increased significantly in some countries with tax systems that are highly favourable to housing (such as Sweden) as well as in countries with relatively unfavourable tax rules (such as France). Similarly, appreciation was muted in countries with both favourable systems (e.g., Portugal) and unfavourable ones (e.g., Japan). Overall, taxation was not the main driver of house price developments during the recent global housing boom (Keen *et al.* 2010).

In addition, the scope for the use of fiscal tools in a cyclical setting is likely to be limited. The institutional setup in most countries separates tax policy from monetary and financial regulation policies, making it extremely hard to implement changes in tax policies as part of a cyclical response with financial stability as the main objective. Instead, local governments may use lower property or transaction tax rates to attract residents during good times if the burden in the case of a bust is shared with other jurisdictions. The ability of cyclical transaction taxes to contain exuberant behaviour in real estate markets may be further compromised if homebuyers do not respond to these taxes fully, because they consider them to be an acceptable cost for an investment with high returns and consumption value. Also, during a boom phase, the incentives to “ride the bubble” may increase efforts to circumvent the measure by misreporting property values or folding the tax into the overall mortgage amount. Finally, as with most tax measures, the distortions created by a cyclical transaction tax may make it more difficult to evaluate a property, which already tends to be a hard task, and also the mobility of households with potential implications for the labour market (Crowe *et al.* 2012). Influence of real estate taxes is further discussed in more detail.

Transaction taxes. Transaction taxes that change with real estate conditions may be, in theory, promising in dealing with booms (Allen, Carletti 2010). But it should be recognized that these taxes induce considerable distortions in real estate markets and, indirectly, in labour markets through their impact on mobility. On the bust side, the use of time-limited tax credits linked to house purchases in the United States and the suspension of stamp duty in the United Kingdom helped stabilize the housing market. And, especially in the United States, the stabilization in prices and revival of activity disappeared with the expiration of the tax breaks (IMF 2010). On the boom side, China and Hong Kong SAR have recently introduced higher stamp duties to dampen real estate prices and discourage speculation. Their experience, however, indicates that transaction

volume responds more than prices do (suggesting that the associated collateral costs are high) and the impact of the introduction of the tax may be transient (Crowe *et al.* 2012).

Property taxes. Some evidence from the United States suggests that higher rates of property taxation may help limit housing booms as well as short-run volatility around an upward trend in prices (more details can be found in Crowe *et al.* 2011). A one standard deviation (\$5 per \$1000 of assessed value) increase in property tax rates is found to be associated with a 0.9 percentage point decline in average annual price growth (compared to annual growth of around 5.6% per year). One interpretation of this finding is that property taxes, indirectly taxing imputed rent, may mitigate the effect of other tax treatments favouring homeownership and perhaps reduce speculative activity in housing markets. Of course, caveats apply in deriving implications from this evidence (Crowe *et al.* 2012).

First, municipalities often face pressure to reduce tax rates when markets are booming and tax revenues are high. This implies that some of the negative correlation between prices and taxes may be spurious, and challenges the ability to use property taxes as a countercyclical tool. In addition, the results may be specific to the U.S. housing market, whose characteristics differ markedly from those in many other advanced economies, let alone emerging markets. Moreover, property tax rates clearly did not cause (or prevent) the emergence of a national housing boom in the United States, although they may have limited its impact on some areas, and the impact at the national level of a hypothetical national property tax might be very different from the localized impact of local taxes (Crowe *et al.* 2012).

Mortgage interest tax deductibility. Theoretically, mortgage interest tax deductibility, by encouraging debt-financing, may lead to higher household debt and more leveraged loans, and, in turn, to more severe financial sector distress during real estate downturns. Empirically, tax reforms that reduce the value of mortgage interest relief have been shown to lead to lower loan-to-value ratios (see Hendershott *et al.* (2003), for the United Kingdom and Dunskey and Follain (2000), for the United States). And, they are estimated to cause an immediate decline in house prices of around 10% (see Agell *et al.* (1995), for Sweden and Capozza *et al.* (1996), for the United States). This evidence suggests that a more neutral tax treatment may help make the economy less vulnerable to real estate busts by reducing incentives for leverage and avoiding artificially elevated prices and homeownership rates. Yet, these estimates are based on one-off changes, hinting at the difficulties in using mortgage interest tax deductibility rules in a cyclical way. Also, deductibility will not eliminate booms. Before the recent crisis, some countries that tax mortgage interest experienced rapid growth in prices and household debt levels (such as Australia) while others

that allow full deductibility did not have as big a boom (such as Switzerland) (Crowe *et al.* 2012).

1.6.4. Macroprudential Regulation

At least in theory, macroprudential measures such as higher capital requirements or limits on various aspects of mortgage credit could be designed to target narrow objectives (for instance, household or bank leverage) and tackle the risks associated with real estate booms more directly and at a lower cost than with monetary or fiscal policy (Crowe *et al.* 2012).

Against the benefit of a lower cost, these measures are likely to present two shortcomings (Crowe *et al.* 2012):

- They may be easier to circumvent as they target a specific type of contracts or group of agents. When this happens, these measures can be counterproductive, as they may lead to liability structures that are more difficult to resolve/renege in busts.
- They may be more difficult to implement from a political economy standpoint. Over time, monetary policy decisions have come to be accepted as a necessary evil thanks to central banks' increasingly achieving credibility and independence.

In contrast, the use of these measures could be considered an unnecessary intrusion into the functioning of markets. The more direct impact of these measures would also complicate implementation as winners and losers would be more evident than in the case of macro policies (although several countries seem to have dealt effectively with this problem).

A major limitation in assessing the effectiveness of macroprudential tools stems from the fact that macroprudential policy frameworks are still in their infancy, and only a handful of countries have actively used them. And these measures have been typically used in combination with macroeconomic policy and direct interventions to the supply side of housing markets (such as in Singapore), further complicating the challenge to attribute outcomes to specific tools. Yet, much can be learned from case studies. Following the Asian crisis, some countries in the region took a more heavy-handed approach to deal with risks posed by real estate booms (Crowe *et al.* 2012).

Countries in Central and Eastern Europe experimented with various measures to control the rapid growth in bank credit to the private sector in the 2000s. Others put in place a dynamic provisioning framework. On the whole, success stories appear to be few, perhaps to some extent reflecting the learning curve in expanding the policy toolkit, improving the design of specific tools, and sorting out implementation challenges (Crowe *et al.* 2012). But, when policy succeeded in slowing down a boom and avoiding a systemic crisis in a bust, it almost

always involved some macroprudential measures to be discussed in more detail (Crowe *et al.* 2012).

Higher capital requirements/risk weights. Capital regulation has a pro-cyclical effect on the supply of credit. During upswings, better fundamentals reduce the riskiness of a given loan portfolio, improving a bank's capital adequacy ratio and its ability to expand its assets. In a downturn, the opposite happens, possibly leading to deleveraging through fire sales. Pro-cyclical capital requirements could help reduce this bias (Crowe *et al.* 2012).

By forcing banks to hold more capital in good times, it would help build buffers for future losses (Gordy, Howells 2006). For real estate loans, the pro-cyclical element of capital regulation is largely absent. In most countries, existing rules do not take collateral values into consideration or reflect the heterogeneity among loans backed by real estate, other than the commercial-residential distinction. Under Basel II's standard approach, risk weights for property loans are fixed (50% for residential mortgages and 100% for commercial property loans). As a result, mortgage loans with predictably different default probabilities (for instance, because of different LTV ratios or exposure to different aggregate shocks) are often bundled in the same risk category and no adjustment is made over time to account for the real estate cycle (Crowe *et al.* 2012).

In this context, capital requirements or risk weights linked to real estate price dynamics could help limit the consequences of boom-bust cycles. By forcing banks to hold more capital against real estate loans during booms, these measures could build a buffer against the losses during busts. And, by increasing the cost of credit, they might reduce demand and contain real estate prices themselves. Finally, weights could be fine-tuned to target regional booms (Crowe *et al.* 2012).

Dynamic provisioning. Dynamic provisioning (the practice of mandating higher loan loss provisions during upswings and one of the elements in Basel III) can help limit credit cycles. The mechanics and benefits are similar to those of pro-cyclical capital requirements. By forcing banks to build (in good times) an extra buffer of provisions, it can help cope with the potential losses that come when the cycle turns (see, for example, the case of Spain). It is, however, unlikely to cause a major increase in the cost of credit, and thus to stop a boom. That said, one advantage over cyclical capital requirements is that dynamic provisioning would not be subject to minima as capital requirements are, so it can be used when capital ratios maintained by banks are already high (Crowe *et al.* 2012).

Provisioning for property loans could be made a specific function of house price dynamics. In periods of booming prices, banks would be forced to increase provisioning, which they would be allowed to wind down during busts. As in the case of risk weights, provisioning requirements could depend on the geographical allocation of a bank's real estate portfolio.

Table 1.5. Macroprudential measures: implementation challenges and evidences
(created by authors basing on Crowe *et al.* 2012)

Measure	Implementation challenges	Evidences
Higher capital requirements/risk weights	<ul style="list-style-type: none"> – Danger of pushing lenders in the direction of riskier loans; – With any other measure increasing the cost of bank credit (when credit is in high demand), procyclical risk weights may be circumvented through recourse to non-bank intermediaries, foreign banks, and off-balance-sheet activities; – Will lose effectiveness when actual bank capital ratios are well in excess of regulatory minima (as often happens during booms); – While improving the resilience of the banking system to busts, tighter requirements are unlikely to have a major effect on credit availability and prices; – May be reluctant to allow banks to reduce risk weights during a bust (when borrowers become less creditworthy). 	<ul style="list-style-type: none"> – The empirical evidence on the effectiveness of these measures is mixed. Several countries have raised capital requirements and/or risk weights on particular groups of real estate loans. Some attempts (such as the cases of Bulgaria, Croatia, Estonia, and Ukraine) failed to stop the boom; others (such as the case of Poland) were at least a partial success. – Even in countries where tighter capital requirements appeared to produce some results on controlling the growth of particular groups of loans, real estate price appreciation and the overall credit growth remained strong.
Dynamic provisioning	<ul style="list-style-type: none"> – Is not meant to have a significant impact on credit and contain other vulnerabilities associated with a boom, such as increases in debt and leverage in the household sector. – Practical issues and unintended effects such as calibration of rules with rather demanding data requirements and earnings management (which may raise issues with tax authorities and securities markets regulators). – Being primarily targeted at commercial banks, dynamic provisioning may be circumvented by intermediaries outside of the regulatory perimeter). – Application of the measure only to domestically regulated banks may hurt their competitiveness and shift lending to banks abroad, raising cross-border supervision issues. 	<ul style="list-style-type: none"> – The experience with these measures suggests that they are effective in strengthening a banking system against the effects of a bust, but do little to stop the boom itself. – Spain led the countries that have adopted countercyclical provisioning. Starting in 2000 and with a major revision in 2004, the Bank of Spain required banks to accumulate additional provisions based on the “latent loss” in their loan portfolios (for more details on the Spanish dynamic provisioning framework, see Saurina 2009). Dynamic provisions forced banks to set aside, on average, the equivalent of 10% of their net operating income. Yet, household leverage grew by a still-high 62% in Spain.

Measure	Implementation challenges	Evidences
Limits on loan-to-value and debt-to-income ratios	<ul style="list-style-type: none"> – Careful design of these measures is a key to limit circumvention. – As it has been for monetary policy, calibration of these tools will be a learning process. And a clear communication strategy will need to be developed to improve their efficiency. – Unlike with more “macro” measures, the consequences of these limits are immediate and transparent. – Beyond these political economy considerations, LTV and DTI limits, by rationing sensitive groups out of credit markets, will entail a cost in terms of diminished inter temporal consumption smoothing and lower investment efficiency. 	<p>Existing empirical evidence suggests that these are promising measures:</p> <ul style="list-style-type: none"> – In a simple cross-section of 21 (mostly) developed countries, maximum LTV limits are positively related to house price appreciation between 2000 and 2007. And back-of-the-envelope calculations suggest that a 10 percentage point increase in maximum LTV allowed by regulations is associated with a 13% increase in nominal house prices – Regressions on a panel of the USA from 1978 to 2008 suggest a weaker association with house price appreciation of a given LTV: roughly 5% increase in house prices for a 10 percentage point increase in LTV. – When the Korean authorities introduced LTV limits in September 2002, month-on-month change in house prices decreased from 3.4% to 0.3% immediately and remained low until April 2003. – In Hong Kong SAR, prudent lending practices guided by LTV and DTI limits have been credited with pausing the house price boom briefly in 1994 and guarding the system against the fallout from the crash in 1997 (Wong <i>et al.</i> 2004, 2011).

Limits on loan-to-value and debt-to-income ratios. A limit on loan-to value (further – LTV) can help prevent the build-up of vulnerabilities on the borrower side (in particular in the household sector). Containing leverage will reduce the risks associated with declines in house prices. Put differently, the lower the leverage, the greater the drop in prices needed to put a borrower into negative equity. In turn, this will likely result in fewer defaults when the bust comes, as more borrowers unable to keep up with their mortgages will be able to sell their houses. In addition, in case of default, lenders will be able to obtain higher recovery ratios. On the macro front, a limit on LTV will reduce the risk that a large sector

of the real economy ends up with a severe debt overhang. In addition, it will reduce the pool of borrowers that can obtain funding (for a given price) and thus will reduce demand pressures and contain the boom (Duca *et al.* 2010).

Similar to limits on LTV, DTI limits will rein in the purchase power of individuals, reducing the pressure on real estate prices. In particular, they will be effective in containing speculative demand (they will screen out borrowers that would qualify for a mortgage only on the assumption the house would be quickly turned around). They will also reduce vulnerabilities, as borrowers will have an “affordability” buffer and will be more resilient to a decline in their income or temporary unemployment (Crowe *et al.* 2012).

Summary of the discussed macroprudential measures, implementation challenges and evidences is provided in Table 1.5.

The correct policy response to real estate booms is, like many other policy-making decisions, an art more than a science. Of the policy options considered, macroprudential measures appear to be the best candidates to achieve the objective of curbing real estate prices and leverage because of their ability to attack the problem at its source, their adaptability to accommodate the specific circumstances in different locations at different times, and their added benefit of increasing the resilience of the banking system (Crowe *et al.* 2012).

Kaklauskas *et al.* (2011a) presented the CARE crisis management model for Lithuania by performing a complex analysis of the micro-, meso- and macro-environmental factors affecting it and presenting recommendations on increasing its competitive capacity. The research was performed by studying the expertise of advanced industrial economies and by adapting such to Lithuania while taking into consideration its specific history, development level, needs and traditions. A simulation was performed by choosing rational micro-, meso- and macro-factors which provide insight into the development of an effective environment for the CARE crisis management model.

The level of efficiency and the scope of activities in the CARE crisis management model depend on many micro-, meso- and macro-level variable factors and on the possibility of optimizing all these variable factors. The main objective of this model is to analyze the best experiences in the field of CARE crisis management, to compare it to the present situation in a particular country and, thereby, to present specific recommendations (Kaklauskas *et al.* 2011).

Some crisis management measures applied by different countries and summarised by Kaklauskas *et al.* (2011) are provided in Table 1.6. Kildienė *et al.* (2011) performed COPRAS based comparative analysis of the European country management capabilities within the construction sector in the time of crisis. Construction and real estate sector modelling was also performed by Kaklauskas *et al.* (2009b, 2010) and Zavadskas *et al.* (2010).

Table 1.6. Measures to revive the construction sector earmarked by EU countries
(according to Kaklauskas *et al.* 2011a)

Country	Measures
Denmark	Reduced interest rates (0.25%) in order to revive the housing market Funding of infrastructure and “green projects” Construction of social housing Building refurbishment
Spain	Infrastructure projects Subsidies to the construction sector (total investment into economic revitalisation makes up EURO 11 billion)
France	Euro 26 billion allocated to economic revitalisation Tax exemptions Investment into infrastructure Investment of Euro 1.9 billion into housing construction and refurbishment Euro 80 million to refurbish prisons and court buildings Guarantees for bank loans
Netherlands	Euro 6 billion allocated to economic revitalisation A scheme of guarantees for banks amounting to Euro 200 billion: to revive loan granting Reduction of VAT for construction sector from 21% to 6% Thermal insulation and refurbishment of public buildings Euro 400 million to restructuring of older districts and refurbishment of public areas Support for small businesses Euro 64 million to training and retraining of employees Accumulation of statistics of people who lose jobs in the construction sector in order to retain people after the crisis. Withdrawn decision to increase VAT and excise rates Reduced tax burden on business Stimulation of exports
Germany	Euro 50 billion allocated for economic revitalisation Investment into infrastructure projects Refurbishment of public buildings Housing refurbishment Reduction of taxes
Sweden	Euro 2.1 billion allocated for economic revitalisation Education and training to create new jobs Investment into infrastructure projects A tax cut of 50% for construction, refurbishment and modernisation of detached houses

It should be noted that the scientific literature is limited on crisis management models’ development. Exemptions are construction and real estate crisis

management models presented in Kaklauskas *et al.* (2009a, 2011, 2013), and Kazokaitis *et al.* (2012). These models are based on multiple criteria assessment. Furthermore, Kaklauskas *et al.* (2015) has presented a unique crisis thermometer for housing market recommendations.

1.7. Case study: Analysis of Construction and Real Estate Market Fluctuations in Lithuania

1.7.1. Macroeconomic context

Lithuania is the largest of the Baltic States, with a population of 2.9 million. Following independence from USSR in 1990, Lithuania emerged as one of the most successful transition states and with accession to EU and NATO in 2004 strengthened its economic prospects and became one of Europe's fastest growing economies.

It was not only a strategic achievement of Lithuania, but also commitment to be an active, solidary and contributing Member State. Lithuanian people who voted for membership of the European Union, firstly foresighted the economic benefits – a better economic situation, bigger market advantages and security guarantees.

Continuous Lithuanian integration process to the EU provides opportunities and incentives for the country to become a strong and modern, to continue to develop and achieve economic growth and social welfare. Membership of the EU ensures the security and fostering of the European values, promotes the pursuit of structural reforms those benefits are visible for every citizen of the Republic of Lithuania in various sectors of economy.

On December 31, 2013 the first Lithuanian Presidency of the EU Council was concluded. It was estimated by the international media as „a solid debut“, as the achieved results surpassed many expectations. Lithuania's EU membership decade is an opportunity to present the results achieved during the Presidency, to discuss the vision of the future of membership of Lithuania and the EU in general as well as the introduction of the euro in Lithuania.

Lithuania was one of the fastest developing countries. Despite global financial and economic crisis, the country's GDP in 2013 was 38% higher than in 2003. Currently, Lithuania is a net beneficiary – from the EU budget receives more than contributes.

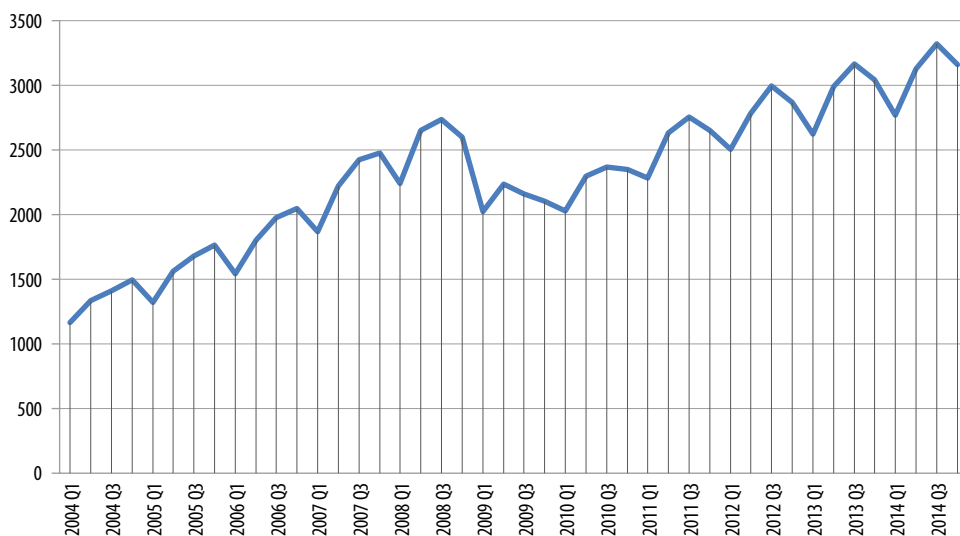
During the decade of the EU membership country has reached 72% of the EU average standard of living, while at the beginning of the membership, it was equal to 52%.

On 23 July, 2014 EU General Affairs Council of Ministers adopted the final decision on Lithuania's participation in the Economic and Monetary Union

(EMU) from the 1st January, 2015. Since that date Lithuania became a full nineteenth member of the Eurozone, with the single European currency – the euro.

Average annual GDP growth from 2000 to 2006 was 7.3% (10.3% in 2003). GDP growth reached 8.8% in 2007. Domestically oriented sectors such as agriculture, construction, internal trade and transport, communications and storage were the most important drivers behind economic expansion (TEGOVA 2012b).

In 2008, the economy began to slow, due to contagion from the global financial meltdown. GDP growth in 2008 was down to 2.86%. In 2009, economy shrunk by almost 15%, one of the worst recession in the EU, largely due to the bursting of the property bubble, higher tax rates, the end of cheap money and the huge contraction in exports. In 2009, private consumption fell 19%, fixed investment plunged 39% while exports fell 15% (see Fig. 1.8) (TEGOVA 2012b).



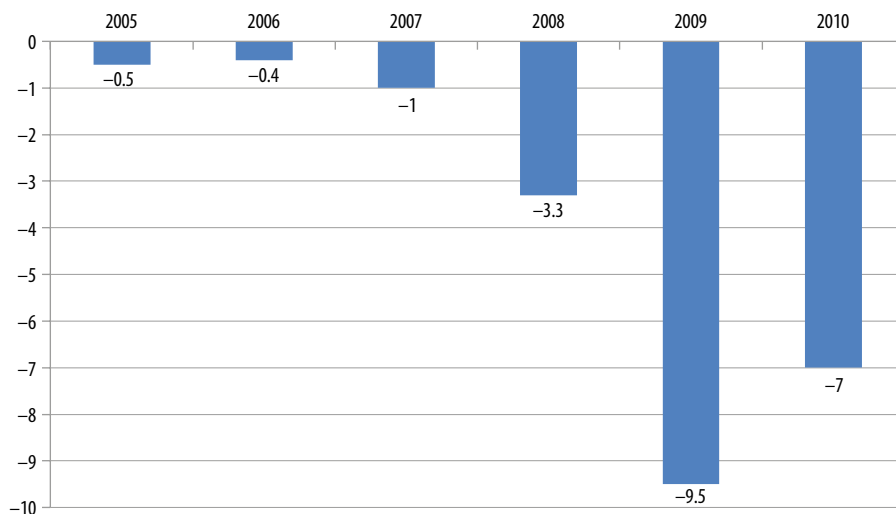
Source: Statistics Lithuania (2015)

Fig. 1.8. GDP per capita in Lithuania (EUR), 2004–2014

The main reasons of economic crisis in Lithuania were the negative tendencies in the real estate market, irresponsible economic policy of the Government and adverse situation in the international markets. 2004–2007 were the years of the fast economic growth in Lithuania as well as in other Baltic countries. Decreasing unemployment, increasing income, hard currency and financial support of the EU were the main factors of growth which, according to Rosenberg (2008), were unprecedented in post war Europe. These factors have laid the basis, as evident at present, to cherish grounded hopes as to the future of the country. Guided by those hopes, both enterprises and households began borrowing for consumption and business ever more and all the more the banks granted

loans with engaging interest. The largest share of loans received by a household was aimed at the real estate market. This process was stimulated by state given tax privileges for lodgings loans which established conditions for forming a real estate bubble. According to the data of the Bank of Lithuania, the volume of loans to acquire lodgings has grown from EUR 14.48 million in 2004 up to EUR 208.53 million in 2007. Such an expansion of credit had decisive influence to form a “bubble” in the Lithuanian real estate market (Davulis 2012).

In the period before the crisis the Lithuanian economics was growing due to the growth of domestic demand which was also maintained by domestic demand-stimulated import growth. However, the import increase was not equivalent to an adequate export increase and the balance of foreign trade was in deficit up to 2009. In such a situation, economic growth was feasible only by borrowing in the international financial market. Constant foreign trade deficit also determined the growth of the current account deficit of the account. In line with the data of the Bank of Lithuania, the current account deficit in Lithuania has grown by almost 300% from 2004 to 2007 and exceeded EUR 4 billion. Though the budget deficit before the crisis was not so high (Fig. 1.9), under the conditions of fast economic growth, it increased overheat of the economy.



Source: Statistics Lithuania (2015)

Fig. 1.9. Lithuanian Government deficit in 2005–2010

On the other hand, the constant budget deficit increased the country's debt which is unacceptable under the conditions of the economic growth (Zucchelli, Kirsebom 2009). Due to the global crisis, increased interests stopped the flow of foreign credits and shook the economic growth basis of the country. As the data

basis of the Lithuanian Department of Statistics show, the rate of the country's GDP growth in 2007 amounting almost up to 10%, fell down up to 3% in 2008 and in 2009 it slowed down up to 15%, Lithuania became one of the countries that most suffered from the crisis.

Lithuania was not prepared for such a situation, because its strategies for economic development, according to Rakauskienė and Krinickienė (2009), were based on the premises of macroeconomic stability and continuous economic growth. It shows that such strategies were created in a formal and unqualified manner.

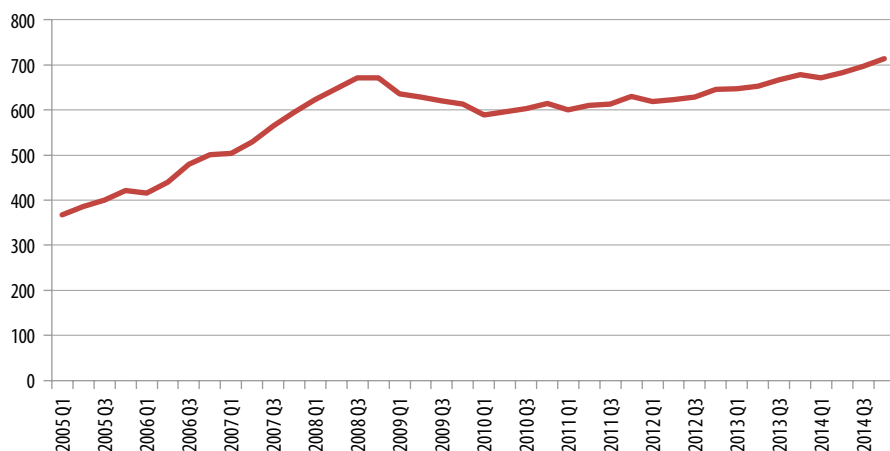
After the burst of the real estate “bubble” in the Lithuanian real estate market, the credit interest, given by the banks operating in Lithuania, has grown as well. That negatively affected the subjects of the Lithuanian economy. Only the processes in the country's real estate market could invoke economic depression, however, it was mostly outside factors that have affected our economics. The global crisis predetermined slowdown of economic growth and consumption decrease of many world countries. Decreasing consumption of foreign countries restricted the chances of the Lithuanian export and that was one of the most important factors that determined the country's economic depression. The domestic market of Lithuania is too small to maintain the growth of economics and to compensate the decrease in export. Indeed, with the revival of markets of foreign countries, Lithuania's possibilities have improved as well (Rosenberg 2008, cited from Davulis 2012).

Hit by the global economic recession, Lithuania's economy started again growing already in the 3rd quarter of 2009. Exports have been the single most important engine, but domestic demand is starting to increase in importance. In January 2010, the European Commission acknowledged that Lithuania has taken adequate measures to counteract the deterioration in its public finances and therefore approved shifting the deadline for correction of excessive deficit from 2011 to 2012 (TEGOVA 2012b).

In 2011 the GDP increased by 5.8% as compared to the previous year. A positive change in the gross value added was observed in all groups of economic activities. The largest growth in the gross value added was observed in construction (by 15%) and trade, transport and communication services (7.3%). In the fourth quarter of 2011, real GDP growth slowed down to 4.3% mainly due to deteriorating situation in global economy, which had a negative effect on external demand and expectations in Lithuania. In 2013 GDP per capita reached EUR 11.7 thousand, 27.9% growth comparing with 2009.

Despite the improvement achieved early in 2014, the financial health of Lithuanian citizens remained weaker than it was before the economic downturn (until 2009). At the end of 2013, real wages were 10% below the level recorded in the third quarter of 2008, which was the highest in the history of this data

series (Fig. 1.10). It means that an average household can purchase 10% less of goods and services than it could until 2009.



Source: Statistics Lithuania (2015)

Fig. 1.10. Average gross wage in Lithuania (EUR), 2005–2014



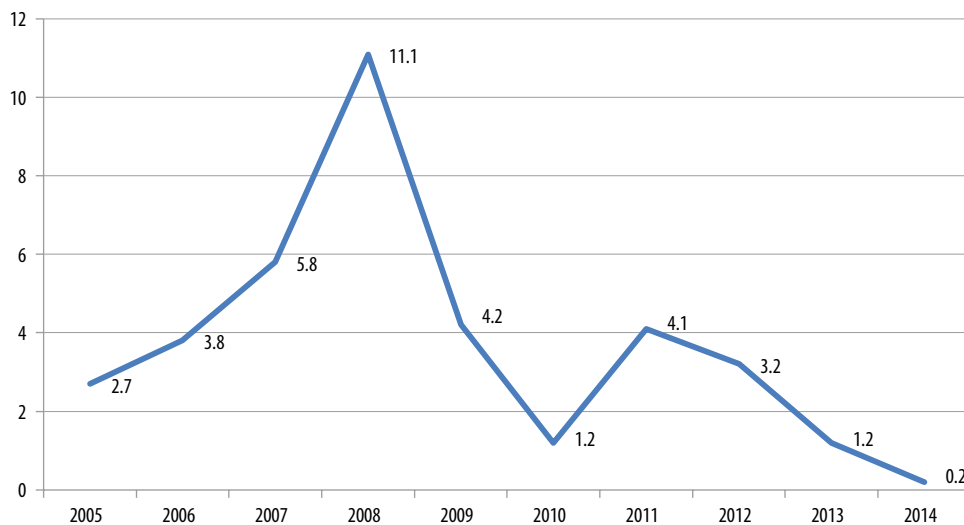
Source: Statistics Lithuania (2015)

Fig. 1.11. Unemployment rate, acc. to Labour Force Survey methodology in Lithuania (%), 2005–2014

Sufficiently high level of unemployment (see Fig. 1.11) and the international and internal migration trends had a significant negative impact on population changes in Lithuania. Population changes in capital Vilnius and the rest of the

cities are different. In Vilnius, due to the growth of internal migrants and returning emigrants number of 25–35 year-old population began to grow moderately from 2012 (in 2013 alone it increased by 3.3 thousand). Demographic trends in the rest of the Lithuanian cities, according to the recent data, in the near future are not expected to be favourable.

Despite of negative facts, in 2013, households saw their financial health improve and their credit risk diminish amid growth in income and employment. In February 2014, the seasonally-adjusted unemployment rate fell by an annual 1.1 p. p. to 11.5%. The average wages went up as well last year and increased faster than inflation. Inflation reached its minimum 0.2% at the end of 2014 (see Fig. 1.12). At the end of 2013, the average real wages exceeded the year-earlier level by 4.1%. Hence the year 2013 witnessed an increase in the number of residents with a regular income from work as well as an increase in the purchasing power of all employed persons. All of this enabled the households to be less cautious in their spending plans and to give more thought to the purchase of durable consumer goods as well as to invest in real estate.



Source: Statistics Lithuania (2015)

Fig. 1.12. Inflation in Lithuania (Harmonised index of consumer prices (year 2005 = 100) in 2005–2014, %

Main macroeconomic indicators since 2009 as well as forecasts of Ministry of Finance for the years 2015–2016 are provided in Table 1.7.

According to Bank of Lithuania (2015), the economic outlook has only worsened in Russia and other Eastern countries. The prospects of economic growth in the euro area and the entire EU are not weaker than expected. External

demand is expected to pick up gradually, which should promote export growth. That growth of exports, in its turn, will act as an important investment driver as it will fuel the need to expand production capacity. The rate of capacity utilization, which is already high, continues to increase. In line with previous trends, a substantial contribution to economic growth should be made by private consumption, which would be supported by improvements in the labour market, including a big increase in employment partially affecting the growth of wages.

Table 1.7. Macroeconomic data of Lithuania

Indicator	2009	2010	2011	2012	2013	2014	2015*	2016*
GDP growth, %	-14.7	1.3	5.8	3.9	3.2	2.9	2.5	3.2
Private consumption growth, %	-17.7	-4.7	6.4	4.7	3.3	5.6	4.1	4.4
Average annual inflation, %	4.2	1.2	4.1	3.2	1.2	0.2	-0.4	1.7
Unemployment rate, %	13.7	17.8	14.8	13.4	11.8	10.7	9.9	9.1
Average monthly gross wage growth, %	-8.7	0.2	2.5	2.6	4.8	5.4	4.8	5.3

* Forecast, Bank of Lithuania. *Source:* Statistics Lithuania (2015)

Consumption should also benefit from price developments. Prices for consumers are not expected to increase this year. Lithuania's economy is projected to grow by 2.7 per cent in 2015. The growth forecast has been revised down from the previous estimate in the context of a less favourable outlook for the tradable sector of the Lithuanian economy. In 2016, the pace of the country's economic growth should pick up amid the expected revival in economic development of the country's trade partners (Bank of Lithuania 2015).

1.7.2. Development of the Construction Sector

Fastest development of construction sector in Lithuania was in 2005–2008, when added value grew from EUR 0.4 billion to EUR 0.87 billion. The main reasons for this rapid development were supply of cheap financial resources and liberal view from banking sector towards real estate development. Significant amount of investments were made not only in residential construction, but also business invested into site development and construction of commercial and industrial premises.

Till the crisis of 2009, construction sector was one of the most developing industry branches in Lithuania. This was mainly caused by the growth of national industry, good credit terms, possibilities given by EU Structural Funds, a larger demand for residential, commercial and industrial buildings, increasing selection of new building materials and technologies.

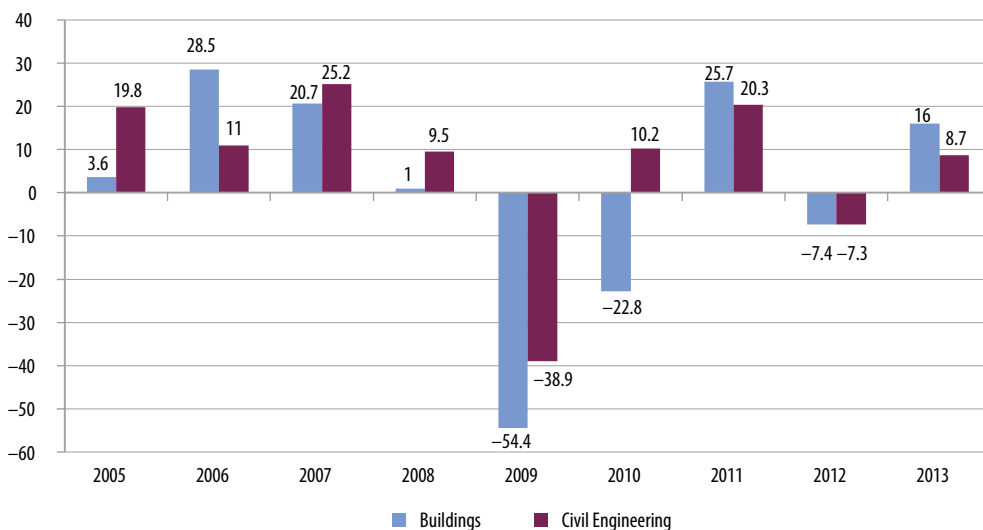
Situation has changed dramatically after the year 2009, when construction sector decline reached more than 60% due to global financial and economic crisis. Over this period financial institutions stopped credit lines for almost all real estate development projects. During the next two years real estate development was financed mainly by the state and businesses own financial resources.

Facing the decreasing demand of their products and services, construction business had skipped their investment plans as well as real estate development and construction of commercial and industrial premises.

This situation also made a major impact on number of construction companies. While in year 2009 there were more than 7000 construction companies, this number has fallen down to less than 5000 in year 2010.

Production of different products was also influenced by economic crisis, so there was a decline of ecological footprint from production of construction materials. The main existing problem with production of raw materials is landscape changing and noise, pollution issues with existing neighbours.

The crisis in the building sector hit all EU-28 countries albeit to a different extent. All countries experienced a decline in building production ranging from an extreme reduction of -54.4% in Lithuania in 2009 (see Fig. 1.13) to almost stable activity levels in Germany and Austria. In several countries (e.g. Estonia, Ireland, Latvia) growth rates had already begun to move downwards before 2009 while in several other countries the drop in building activities happened in a more sudden way and was shorter (Eurostat 2015).



Source: Eurostat (2015)

Fig. 1.13. Annual rates of change for buildings and civil engineering in Lithuania, working-day adjusted, 2005–2013

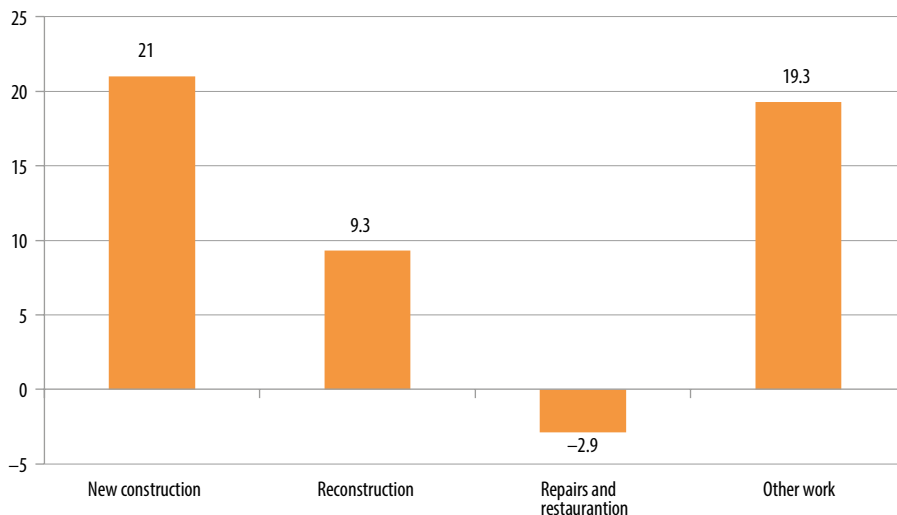
In 2010 construction sector of Lithuania had approximately 5 thousand of enterprises of which 39% were specialized in constructing buildings and their parts. Small enterprises (the personnel is less than 49) are prevailing in this sector. The largest concentration of construction enterprises was in Vilnius and Kaunas counties. This situation was mainly caused by unequal distribution of investments within the territory of Lithuania.

According to Statistics Lithuania (2015), in 2010 Q3 construction enterprises carried out own-account work for EUR 0.52 billion, which is by 8.7% more than in 2009 Q3. The value of construction work carried out in the territory of Lithuania equalled to EUR 0.49 billion, which was by 6.7% cent more than in the last year. The increase in construction works was mostly determined by civil engineering works, the value whereof amounted to EUR 0.29 billion (see Table 1.10). Rate of change in construction output between pre-crisis peak and 2010 in Lithuania was almost -50%. Rate of change between years 2000 and 2010 was equal to +50%. The pre-crisis peak varies according to the geographic entity under consideration; estimates; working day adjusted series. No discernible peak observed prior to or during the financial and economic crisis; the index of production continued to expand.

In the year 2011 construction sector had approximately 85 thousand of workers. The majority of workers were men (about 93.5%). According to the groups of working places the most abundant is the group of skilled workers.

In 2011 situation has changed to positive. According to Statistics Lithuania (2015), developers carried out construction work worth a total of EUR 1.9 billion, up 22.7% compared with a year before. In the fourth quarter alone, developers carried out construction work worth EUR 0.67 billion, up 2.6% versus the previous quarter. The value of engineering structures construction work was equal to EUR 1.04 billion, accounting for 55% of the total value of works performed within the country. The value of non-residential building construction amounted to EUR 0.72 (38% of the total). New construction work accounted for 42% of total construction work performed within the country last year, reconstruction work – for 32%, repairs and other construction work – for 26% of the total.

In 2012 EUR 2.11 billion were assigned for construction work in Lithuania, which was 15.9% more than in 2011. In 2013 new construction works carried out in Lithuania were constituted 43.9% of all construction works, while reconstruction took only 29.7%, repair and restoration – 26.4 %. At the same time it was a great difference between growth in activities – the new construction work increased by 21% in 2013, in comparison to 2012 year, reconstruction grew only 9.3%, other construction work – 19.3% of growth. But repairs and restoration work showed drop by 2.9%. See Figure 1.14 below.



Source: Statistics Lithuania (2015)

Fig. 1.14. Growth of different kinds of construction work carried out in Lithuania in 2013 on comparison with 2012

Table 1.8. Changes construction works carried out, at constant prices, growth, drop (-),%

Year	Construction work carried out within the country at current prices EUR thousand			Indices of construction work carried out within the country compared to the previous year %		
	All construction units	Buildings	Civil engineering structures	All construction units	Buildings	Civil engineering structures
2008	3,616,478	2,221,892	1,394,586	103.7	100.2	109.5
2009	1,672,784	894,282	778,502	51.5	45.5	60.6
2010	1,489,447	655,550	833,897	92.9	76.7	111.4
2011	1,897,924	863,506	1,034,418	122.6	126.3	119.8
2012	1,821,077	830,936	990,141	92.5	93.3	91.9
2013	2,110,143	996,343	1,113,800	111.3	115.3	108.0
2014	2,522,466	1,265,055	1,257,411	116.7	123.7	110.4

Source: Statistics Lithuania (2015)

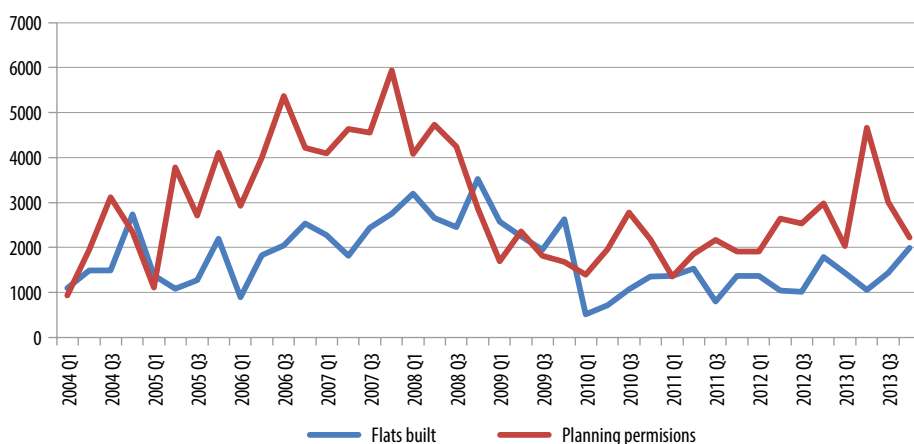
Construction growth was also considerable in 2014. According to Statistics Lithuania, in the second quarter of 2014, against the second quarter of 2013,

the volume of construction work carried out increased by 16.8% and amounted to EUR 637 million. The construction work carried out within the country accounted for 94% (EUR 608 million) of the total construction work, outside the country – 6% (EUR 38 million).

In the second quarter of 2014, against the first quarter of 2014, seasonally adjusted volume of construction work carried out within the country decreased by 3.5%. In the second quarter of 2014, against the first quarter of 2014, the volume of construction work carried out outside the country rose by 17.3%. Against the same quarter of 2013, the volume of construction work carried out within the country increased by 18% at constant prices.

Changes of construction works during the analysed period are summarized in Table 1.8.

Considerable fluctuations of construction market in Lithuania reflect in changes of building the new flats and planning permissions. During the crisis period, especially in 2009–2010, planning permissions for residential construction substantially decreased and in 2011 there were less than 18% planning permissions issued in comparison to 2006 (see Fig. 1.15).

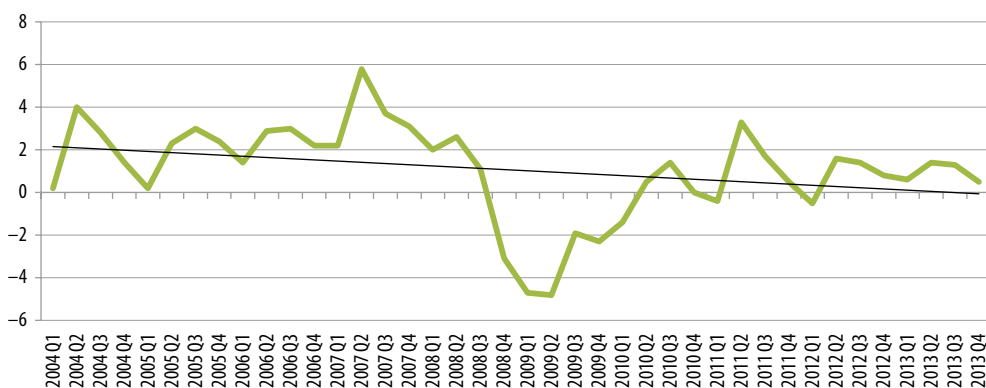


Source: Statistics Lithuania (2015)

Fig. 1.15. Number of new flats built and residential building permits in 2004–2013

The building of new housing significantly decreased only in 2010, as during 2009, even in the period crisis, developers were finishing previously started construction projects. In 2009 there were 4,002 residential buildings built, and in 2010 only 3,667 buildings – 8.37% less than in previous year. After the building of the flats slightly increased and in the second quarter of 2013 reached its highest level after the crisis – 4,664 new flats were built almost as much as in the second quarter of 2008 (see Fig. 1.15).

Cyclical fluctuations of construction market also reflected in changes of construction price index. In 2008–2010 construction prices significantly decreased. First decrease started in the fourth quarter of 2008 – construction prices decreased by 3.1%, during the year 2009 prices continued to decrease since reached the lowest level in the second quarter of 2009. Slight increase in construction market is observed only since the second quarter of 2010 (see Fig. 1.16).



Source: Statistics Lithuania (2015)

Fig. 1.16. Construction price index in Lithuania, 2004–2013

All the indicators show that currently the construction business in Lithuania is recovering after the crisis. The Lithuanian statistics shows that the number of construction companies and number of people, involved in construction industry has been increasing, especially since 2011 year (see Table 1.9 for detail statistics).

Table 1.9. Number of companies and employees in Lithuanian construction industry, 2011–2014

Year	Number of enterprises in operation				Number of employees			
	2011	2012	2013	2014	2011	2012	2013	2014
Construction of buildings	2,934	3,017	3,070	3,619	36,263	40,116	40,448	41,974
Civil Engineering	297	306	321	381	15,198	16,560	16,237	17,199
Specialised construction activities	2,709	2,710	2,729	2,981	2,723	29,896	30,340	30,767
Total	5,940	6,033	6,120	6,981	78,693	86,572	87,065	89,940

Source: Statistics Lithuania (2015)

Lithuanian construction sector can be characterized by a large quantity of little construction companies (9 and less employees). It should be noticed that such a characteristic makes industry and infrastructure profitable. The fragmentation of this sector allows completing projects in time and with high responsibility. Moreover such situation gives more opportunities for small and medium enterprises development in Lithuania (EUROMIG 2015).

Further perspectives for the development of construction sector can be valued rather positively. They are related to the demand for the construction of residential and non-residential buildings (offices, logistic and commercial premises) in bigger cities of Lithuania. At present, based on the turnover indicators, a new construction is dominating, however, due to the prevailing morally old and energetically non-effective residential fund, in future the amount of reconstruction works can significantly increase in Lithuania.

About 96% of apartments in Lithuania were built before 1993. Most are energetically and economically inefficient. It requires a budget of more than EUR 12.5 billion for refurbishment of these buildings. To speed up the refurbishment process, the Government of Lithuania has developed a financial model for reconstruction of living premises. It provides funds for the renovation of attracting a variety of sources: the European Union, the state budget and the residents. Access to EU funds is JESSICA fund. Lithuania was one of the first countries in the European Union to use JESSICA initiative to improve energy efficiency.

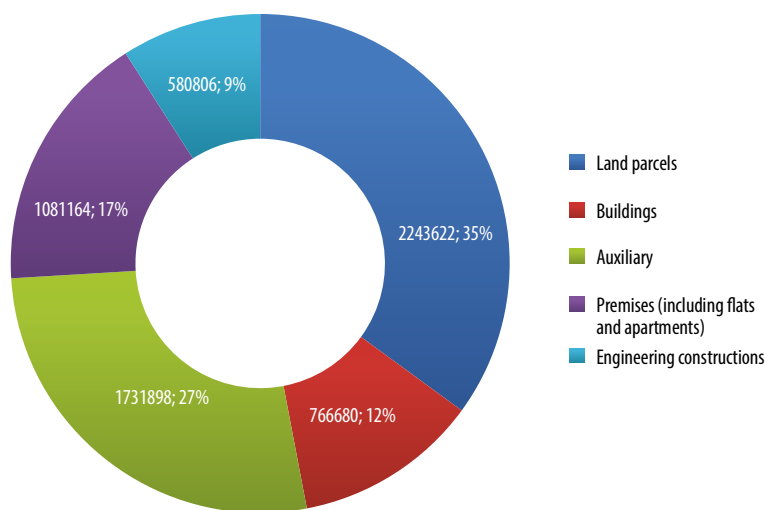
1.7.3. Real Estate Market and Its Fluctuations

Real property objects in Lithuania are land parcels and structures. Real property object is considered to be formed when its cadastral data are identified and decision on its formation is made by a public administration entity in the manner prescribed by laws. All legally formed real property objects are subject to registration in the Real Property Cadastre and Register. Only registered property objects may be subject to any transaction.

According to the Centre of Registers, on 1st May, 2015 in Lithuania were registered over 6 million (6,404,170) units of real estate, including: 2,243,622 – land parcels, 766,680 buildings, 1,731,898 auxiliary premises, 1,081,164 – premises (including flats and apartments), 580,806 engineering constructions (see Fig. 1.17).

Both real estate and construction sectors kept growth tendencies during the last decade. Gross average value for the construction sector in 2000 year was EUR 706.39 million, for comparison, in 2007 increased to EUR 2,604.34 million; real estate in 2000 year was EUR 1,211.31 million, in 2007 year was EUR 3,036.21 million. Such growth of real estate market can be explained due to foreign investments and favourable banking conditions. One of real estate market growth determinants – employment in construction sector in 2000 year was

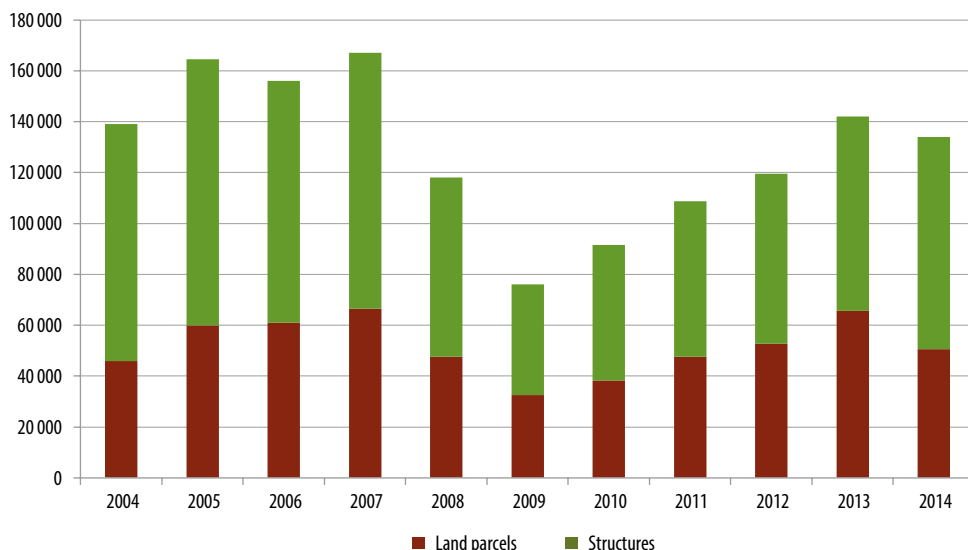
83.1 thousand people and in 2008 was 169.2 thousand people. As banking sector composed favourable conditions to take mortgages by lowering interest rate, the real estate market was visibly activated. Highest interest rate was in 2000 and real estate 1 sq. m. price was at its lowest level. The highest price jump was in 2004, after Lithuania has joined the European Union. Possibly optimistic expectations, emigrant savings investments into real estate in motherland enhanced the demand of real estate what forced the real estate prices increase fast. Bust of real estate price was slow down by the increase of interest rate for housing in 2006 year, which lowered the number of taken and given mortgages in 2007 and significantly in 2008 year. Real estate and construction sector in the national economy at the peak of the boom (2007–2008) amounted 21% of GDP, 9.7% of country's FDI (TEGOVA 2012b).



Source: Centre of Registers (2015)

Fig. 1.17. Real estate units registered in Lithuania 01-05-2015

Figure 1.18 depicts the total number of land and structures' transactions during the past decade. Provided data reflects cyclical fluctuations in Lithuanian real estate market. Period of 2004–2007 can be characterized as expansion, followed by substantial increase of transactions for both land parcels and structures. In 2005 the number of land transactions increased by 23%, number of transactions of structures – by 11%. In 2006 the number of land transactions remained almost unchanged; indeed there was a 10% decrease in transactions for structures. In 2007 real estate market reached its peak – number of land transactions increased by almost 8% and for structures – by almost 6% in comparison to 2006.



Source: Centre of Registers (2015)

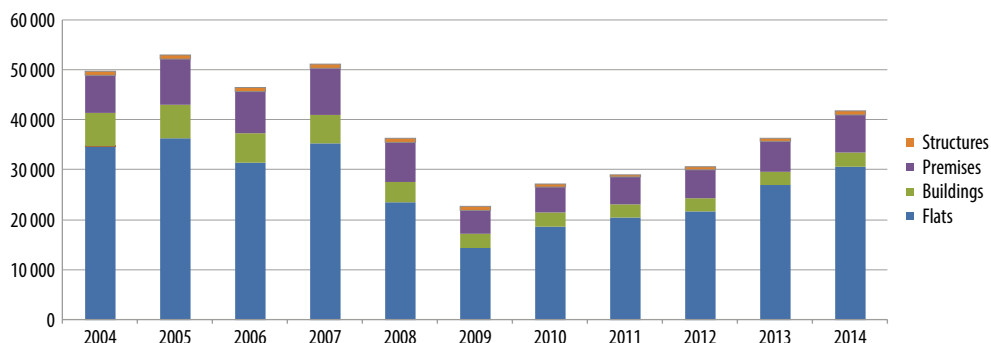
Fig. 1.18. General number of transactions in Lithuania, 2004–2014

Activity of real estate market has changed in 2008 due to global economic crisis and worsening situation in Lithuanian economy. Number of transactions for both land and structures decreased approximately by 30% in comparison to 2007. In 2009 real estate market activity reached its bottom. Number of transactions for land decreased by 31% and for structures even by 38%.

Period of 2010–2014 can be characterized as recovery of the activity in real estate market. In 2012 number of transactions for land parcels increased by 38% and for structures by 35% in comparison to 2009. In 2013 a record-breaking activity after the crisis has been observed in the Lithuanian land market – number of transactions for land parcels increased by 19% and almost reached the level of 2007. Number of structures' transactions increased by 12%.

The real estate market of 2014 was variable. The year started from a great optimism, but due to the military conflict between Russia and Ukraine the activity and optimism in the market started fading in the second half-year. Number of land transactions for land parcels decreased by 23%, while number of transactions for structures slightly increased by almost 9%.

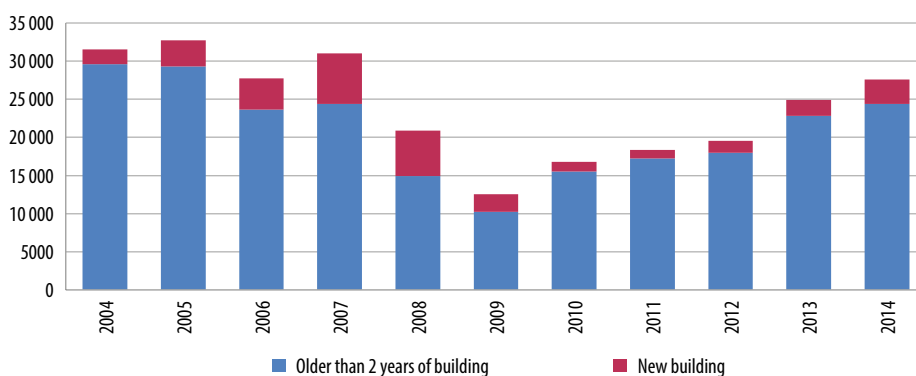
Figure 1.19 depicts number of building transactions during the period of 2004–2014 and reflects cyclical nature of Lithuanian real estate market. It can be observed that transactions for flats dominated through whole analysed period, indeed the housing market was variable.



Source: Centre of Registers (2015)

Fig. 1.19. Number of building transactions in Lithuania, 2004–2014

Figure 1.20 provides more detail statistics on transactions of flats during the period of 2004–2014 and considers buildings' construction time: flats in new building and buildings which are older than two years. Data reveals that despite the growing number of construction, the residential housing stock in Lithuania is rather old. Transactions' statistics below show that most of the flats sold had been constructed more than two years ago. Substantial increase in transactions of new flats is observed in 2007 – the year of Lithuanian real estate market peak.



Source: Centre of Registers (2015)

Fig. 1.20. Transactions of flats in Lithuania, 2004–2014

The development of the residential real estate market in Lithuania can be characterized by several stages. Market expansion started in 2004, indeed some variations were visible. For instance, housing market correction in Lithuania took place in 2006 as reflected by a smaller number of transactions (number of transactions concluded in 2006 was 14% lower than that in 2005).

After postponement of euro currency adoption, part of population was expecting a turnaround in the market and postponed their purchases, what, in turn, contributed to diminishing of the number of transactions and exerted negative pressure on housing prices.

The signs of housing market slowdown became more evident in 2007. Although the overall annual price growth remained positive (21%), the price growth in the fourth quarter declined significantly, and the number of transactions went down by 20%, compared to the third quarter, contrary to the usually observed end-of-year seasonal rally of market activity. The number of speculative transactions, when housing is purchased for the purpose of its future sale for a higher price, fell altogether with the first-time buyer demand, which shrank significantly.

Due to declining demand and increasing supply, the housing supply started to exceed the demand at the end of 2007 and in the beginning of 2008. The decline in demand was reflected by markedly smaller numbers of loans for house purchase granted and transactions concluded. The number of transactions concluded in the fourth quarter of 2007 was lower by 17% than in the fourth quarter of 2006, whereas the number of transactions concluded in January 2008 was lower by 25% than in the same period a year ago. In 2009 changes in the supply-demand ratio led to a correction of prices for real estate and a decrease in the number of transactions.

The most drastic changes were noticed in the construction of multi-flat houses where in 2008 the number of constructed apartment buildings reached 169 while in 2010 it dropped to 19 apartment buildings.

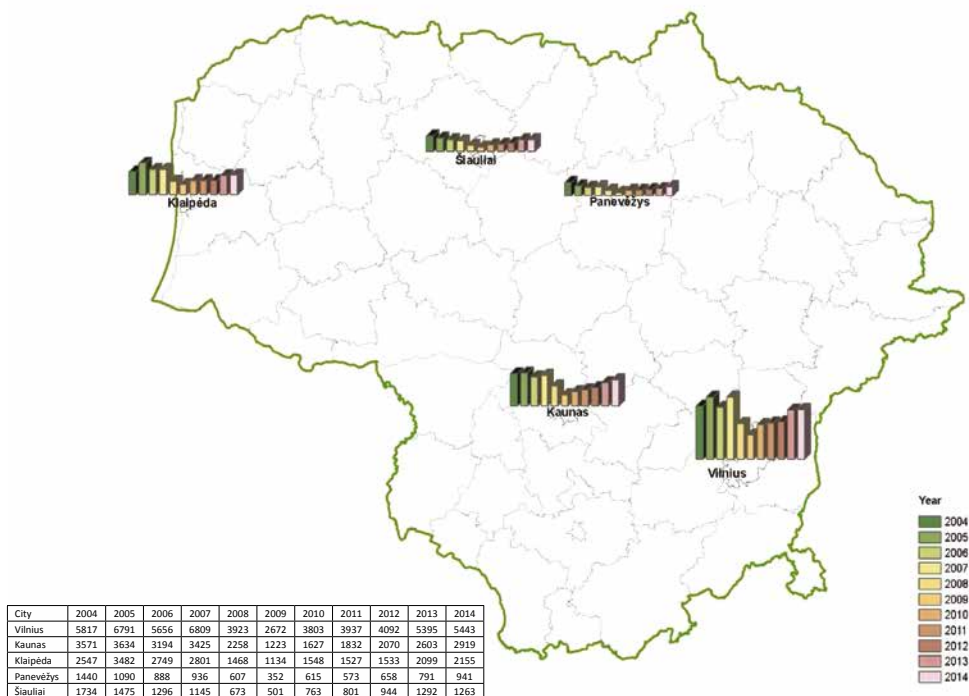
In 2011, the number of housing purchase/sale contracts increased by 8% compared with the corresponding period in 2010. The trends varied in different residential housing segments. Newly built residential housing was traded most actively as the number of contracts grew by over 15%, year on year.

In 2012, the number of transactions in the real estate market, also of issued construction permits and the newly built housing units went up. However, the acquisition of own housing was to a smaller extent financed by bank loans: in 2008, more than half of housing units transferred under purchase-sale transactions were secured by pledging the property, while in 2012, this share decreased twice. Not anticipating any major changes in terms of prices in the real estate market potential buyers were rather cautious in assessing a potential acquisition of housing, and more frequently they were funding the acquisition transaction from own resources.

The year 2013 witnessed a breakthrough in the real estate market – both in terms of activity and in terms of price developments. In the middle of the year 2013, the growth in the number of transactions concluded in the market started to accelerate. As far as the housing segment is concerned, the activity started to

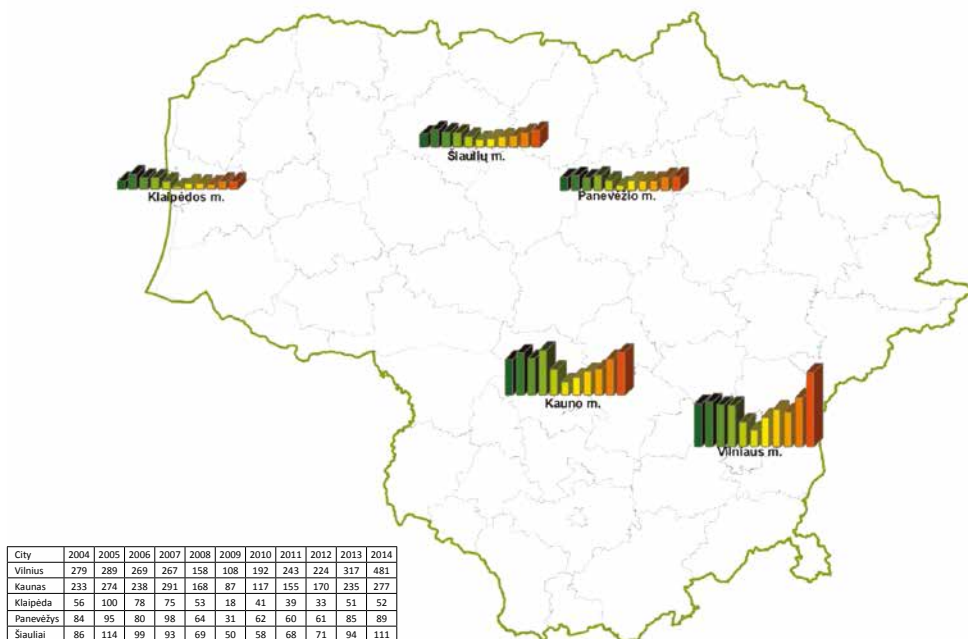
expand at a faster rate as well. The number of real estate transactions concluded in 2013 increased by 22.5% versus the previous year to 124,000.

The real estate market of 2014 was variable in Lithuania. The year started from a great optimism, but due to the military conflict between Russia and Ukraine the activity and optimism in the market started fading in the second half-year. It affected the segment of flats the most, where in the second half-year of 2014 the amount of purchase-sale transactions has decreased by 4.8%, in comparison with the first one. It was the first time in the period of several years when a semi-annual decrease in the amount of transactions was registered in Lithuania. The highest decrease was observed in the major cities (Vilnius, Klaipėda, Šiauliai and Panevėžys) – from 8% to 18% (Fig. 1.21). In this context, there was an exception in Kaunas, because the amount of transactions has remained stable over the second half-year. On the other hand, not all segments responded to the gloom. Opposite trends were developing in the segment of private houses, where the amount of purchase-sale transactions has been growing in the second half-year of 2014 – in comparison with the first half-year, the change reached 8.7% (Fig. 1.22).



Source: Centre of Registers (2015)

Fig. 1.21. Sales transactions of flats in major cities of Lithuania, 2004–2014



Source: Centre of Registers (2015)

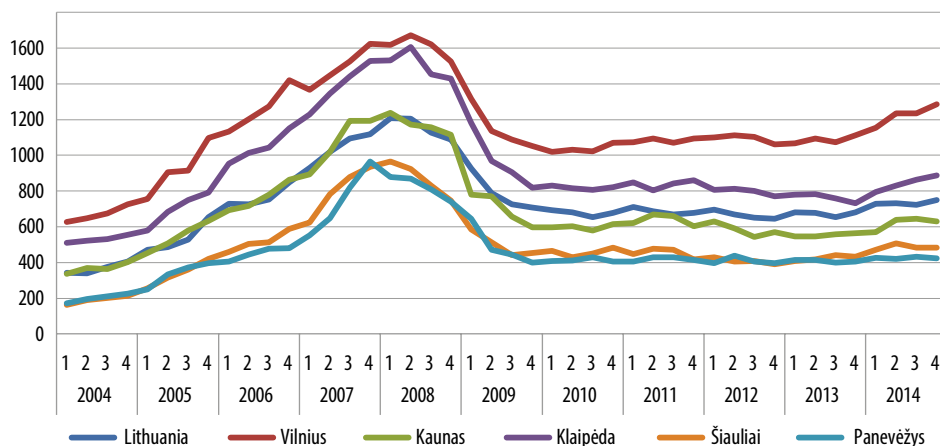
Fig. 1.22. Sales transactions of residential houses in major cities of Lithuania, 2004–2014

Real estate market fluctuations mostly reflected in residential property prices. In 2005 the growth of the real estate market in Lithuania had reached a record high. Average increases in the prices of flats in the country's larger cities had grown 50%, and as high as 120% in certain segments in one year. Enormous increase in prices continued through period of 2006–2008 (see Fig. 1.23). Lithuania entered recession by 2009 as the GDP registered fell down to –14.8%. Unemployment rate increased sharply and reached 13.8%. Gross wages were also reportedly lower than the previous years due to weakened domestic economy. Inflation rate meanwhile fell sharply. To the end of 2009 housing prices fell from their peak by 40% – according to transaction statistics the highest price was registered in the first quarter of 2008.

Lithuania house price index was down 31.1% on year over year basis, losing 37.2% of its value since the peak. First quarter saw the house price index of Lithuania down 20.0% (quarter-on-quarter % change). Vilnius, Kaunas and Klaipėda registered depreciation in housing price by 19.7%, 26.2%, and 37.0%, accordingly.

Economy of Lithuania made a slow recovery in 2010, as the economy clawed back from recession in 2008 and 2009. Housing prices also recovered albeit at a

slower rate or stagnant in major cities. Official House Price Index for Lithuania up by 1.3% on year-on-year basis. Despite recording a down by 1.9% (quarter-on-quarter % change) in the first quarter, the house price index rebounded by the second quarter, thus marking the recovery of house price index.



Source: Centre of Registers (2015)

Fig. 1.23. Prices of flats in Lithuania, 2004–2014 (weighted averages, in Euro)

Since spring 2010, the real estate price changes were insignificant, compared to the preceding period of decline for more than two years. Compared to the highest level, housing prices were almost two times lower.

Real estate prices which have remained broadly unchanged since the beginning of 2011 and low interest rates had a positive impact on the housing affordability. Although prices of real estate remained broadly unchanged, the activity in the market was gradually recovering. With the financial standing of households gaining strength the possibilities to acquire own housing (housing affordability index) improved materially. This contributed largely to the raise of activity in the real estate market.

In the first half of 2012, trends in the economic slowdown, which had been observed at the end of 2011, continued to intensify in Lithuania. Similar trends were in the real estate market: the year of 2012 has started with a cautious optimism; though, halfway the year, the market took run, and many market segments recorded growth in transactions, some of them – even increase in prices.

It can be summarized that the last decade revealed two interdependent processes: an economic and financial convergence process on one hand, and credit and housing boom on the other. Starting from relatively low levels, credit to the private sector grew on average by 51% annually in the period from 2003 to 2007, then showed signs of stagnation and eventually – trend reversal. House

prices more than tripled over the same period before market liquidity dried up in 2008 and house prices plummeted by some 25% from the peak.

At the end of 2007, the real estate market, which largely contributed to the recent economic boom, started showing signs of stagnation: the housing price growth subsided and the number of real estate transactions decreased. Due to increased uncertainty and banks tightening credit availability, lending for house purchase and to the housing market-related enterprises declined significantly since the 4th quarter of 2007 (TEGOVA 2012b).

Although the majority of buyers use own funds to finance their housing transactions, the banks have stepped up lending for house purchase. Data from the State Enterprise Centre of Registers has shown that nearly 29% of housing transactions concluded by natural persons in 2013 involved mortgaging the properties concerned. According to the data made available by the Central Mortgage Office, this proportion remained broadly the same in the first quarter of 2014. Although the share of transactions with borrowed funds is basically unchanged, the total number of market made transactions, which it forms a part of, is increasing with each period (the number of housing loans is growing). As shown by the data from the Household Financial Monitoring Information System maintained by the Bank of Lithuania, the number of new housing loans issued in 2013 soared by 53% from the previous year to exceed 16,000, which was still 60% below the level achieved in 2007. Moreover, home prices are still relatively low compared to 2007–2008 hence the properties being financed are less expensive. The average value of a new housing loan fell to EUR 24,328 in Q1 2013 from EUR 37,940 in Q4 2008. This implies that since the global financial crisis, the relations, which existed until the beginning of 2009 between the number of loans and their value, have changed. As a result, the value of housing loans remains stable although their number is actually increasing.

There were some attempts of Lithuanian researches to analyse the main determinants of prices changes during the period of 2004–2008 (e.g. Galinienė *et al.* 2006; Ivanauskas *et al.* 2008; Tupėnaitė, Kanapeckienė 2009; Kaklauskas *et al.* 2010a, b; Azbainis, Rudzkienė 2011).

Galiniene *et al.* (2006) and Ivanauskas *et al.* (2008) analysed residential real estate market trends in the Baltic countries and identified the following factors that influence changes in real estate prices: the economic situation in the country, the construction cost of the new building, available new housing, expectations and housing affordability.

Tupėnaitė and Kanapeckienė (2009) conducted a research on the main factors contributing to real estate prices changes in the Baltic countries. In their study, the authors had identified two groups of factors: fundamental factors and irrational factors as well as the influence of mortgage lending. Authors distinguished the following fundamental growth indicators: GDP, inflation, wages,

unemployment. The authors found that the Baltic countries, experienced prices bubble during the period of 2004–2006. Increase in housing prices was affected by fundamental factors: growing GDP, wages, increased employment, and low inflation. However, house price growth has been much faster than economic improvements. This shows that during the analysed period housing was overvalued and that the price increase was determined by other than fundamental factors. Authors also analysed the construction market related fundamental factors: housing supply shortage and price increase of construction. It was found that over the long-term economic factors and rising construction costs were not significant enough to explain rapid growth of real estate prices. Authors came to conclusion that the growth of the housing prices was largely driven by favourable mortgage lending policies and irrational market factors: population expectations and speculation in the real estate market.

Kaklauskas *et al.* (2010a, b) explained real estate market fluctuations by a system of macro, meso and micro-environmental factors.

According to Azbainis and Rudzkienė (2011), in examination of transition economies, it is necessary to draw attention to consumers' expectations. In Central and Eastern European countries, the population was aware that in Western European countries, the cost of living is much higher and the accession to the European Union is linked to enrichment. These factors also contributed to the exaggerated expectations for euro prices and proximity to other European Union member states to the average level of prices.

Azbainis and Rudzkienė (2011) also performed Lithuanian real estate market analysis during period of 2000–2009. In the initial stage of the investigation large data matrix was developed in which the real estate market fluctuations were assessed according to 28 factors. The factor analysis method was applied in order to reduce the number of factors and to select seven key variables: bank loans granted to clients, number of accomplished dwellings, consumer confidence indicator, the average interest rate on loans in LTL, the average price of precast bedroom apartment in Vilnius district, annual real GDP growth, and average annual inflation (HICP).

These variables were divided into two factors, the first of which can be called rational factors associated with real housing prices, while the second – irrational, reflecting consumer expectations. According to the authors, conducted variables correlation analysis for short sequences are not very accurate, but suggests that during the analysed period the growth of real estate prices was influenced by the amount of loans granted by banks and consumer confidence, low interest rates on loans and growing GDP.

On the basis of Statistics Lithuania and data of Centre of Registers, authors of this monograph also performed the pilot correlation analysis among changes of real estate prices and some real estate market determinants. Results are provided in Figure 1.24.

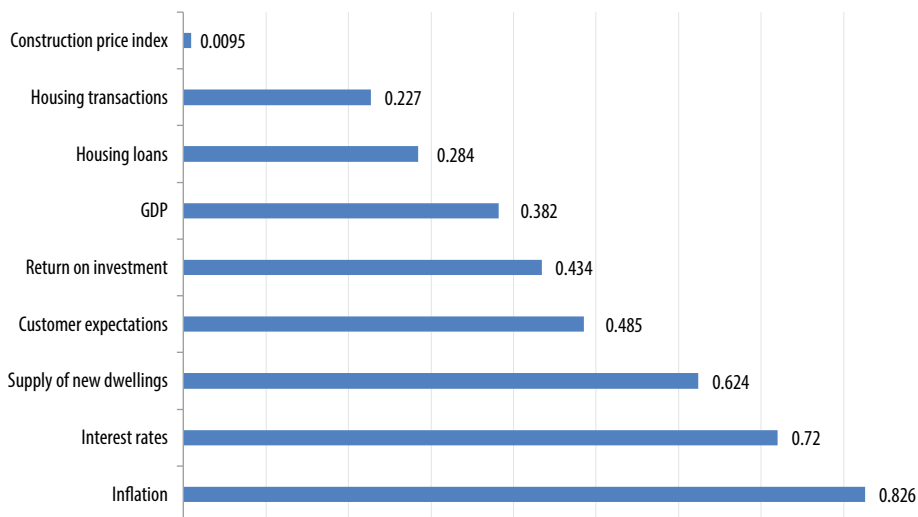


Fig. 1.24. Determinants of residential real estate prices (correlation coefficients) (analysed period 2004–2014)

Analysis revealed that the greatest impact on the real estate price fluctuations during the period of 2004–2014 had rational factors: inflation ($r = 0.826$), interest rates ($r = 0.72$), and new housing supply ($r = 0.624$). The average impact was also observed in irrational factors' group: consumer expectations ($r = 0.485$) and return on investment ($r = 0.434$).

1.7.4. Real Estate Crisis Management Tools Applied in Lithuania and other Baltic countries

It should be admitted that Lithuania met the crisis being quite unprepared to it, though the the global crisis reached Lithuania in 2009. For motion of a budget in deficit under the conditions of rapid economic growth contradicts not only the economic principles but also the common sense: the excess surplus budget would prevent 'overheat' of economy and establish conditions to mitigate the consequences of the crisis (Davulis 2012).

Meanwhile, the Estonian political forces showed much better responsibility in making coordinated decisions (Andersen 2009). In 2007 the Fiscal Discipline Law (the Law) was passed the purpose of which was to ensure the financial stability of the governmental sector and a stable development of the economy. The Law determined that the deficit of the governmental sector in 2008 could not be higher than 0.5% of the GDP. It is evident that the Law was adopted too late and its requirement could not be realised when the crisis had already started. In the presence of the crisis, the Bank of Lithuania and the Parliament of the Republic of Lithuania have decided: to diminish the mandatory reserve norm from 6 to

4% and to increase the deposit insurance sum up to EUR 100,000 with a view to vivify the domestic market using additional financial resources. Though those decisions were correct and adopted in time, unfortunately, their effect seemed to be insufficient. To maintain the market activity a more intensive promotion of economy was necessary. However, due to an inadvertent and irresponsible budget policy persuaded in the years of economic rise progress, there were no resources to stimulate the economics. Therefore, nothing else remained but to take measures that were usually applied at the time of economic growth and not during the period of depression. The newly elected Parliament of the Republic of Lithuania and the Government undertook to apply the measure of restrictive fiscal policy: to decrease expenditure and increase taxes in order to stabilise state finances, which was persistently recommended by the European Commission (2012).

At the end of 2008, a decision was made to increase the rate of value-added tax up to 19% (later on it was increased up to 21%), income-tax, excise duty on fuel, cigarettes and alcohol, as well as to eliminate the majority of reduced tariffs of the value-added tax. The so-called “night” tax reform came into effect on 7 January 2009. The tax reform was aimed more at collecting more budget revenues and stabilising the state finance system than at neutralising the consequences of the crisis, not so much attention was paid to real estate market. However, in 2009 much less state budget revenue was collected than in 2008. Such a result was largely determined by the economic depression; however there are little doubts that the “night” tax reform was a great governmental lapse and that it was damaging rather than useful for the country’s economy (Davulis 2012).

In the years of economic growth before the crisis, the state budget was not only formed in deficit but also its expenditure was constantly increased. Therefore, as a result of the crisis, with a slump in budget revenues huge budget deficit appeared as the state liabilities to finance various spheres all remained the same. Due to that reason the budget deficit, as showed by the databases of the Lithuanian Department of Statistics, amounted up to 3.2% in 2008 and even up to 9% of the GDP in 2009, i.e. almost three times higher than the Maastricht criterion.

Thus, the Government had to adopt an undersubscribed decision – to pursue the so-called retrenchment policy, i.e., to diminish government expenses by lowering the employees’ ‘and officials’ salaries, pensions, and social benefits, whereas such a policy is assessed ambiguously. On the one hand, it allows diminishing government expenses, on the other hand, it decreases income of the population and thereby consumer demand (Davulis 2012).

The decrease in demand even more weakened the housing market. The domestic market revives only if income of the population starts growing and consumer demand increases.

Apart from the above-mentioned financial stabilisation measures, the anti-crisis governmental plan provided for the improvement of business environment and financial support to business, promotion of export and investments, utilisation of the EU structural support, and renovation of the multi-storey buildings (Davulis 2012).

Given the fact that the planning and construction document preparation, co-ordination and decision-making processes have become long, complicated and confusing, and the number of involved institutions had significantly increased, the Lithuanian Government set a task for legal reform in the formation of real property objects (Sabaliauskas 2012).

From 1 October 2010 a new version of the Law on Construction entered into force in Lithuania, which brought in some improvements, such as:

- removed the possibility to derogate from mandatory requirements, and all deviations and compensatory measures should be agreed with the bodies establishing the requirements;
- streamlined the procedures for completion of construction. Construction is completed when it is approved by an act or a declaration on completion of construction;
- established the regulatory procedure for legalization of illegal construction, e.g. when a construction has been started without a building permit documentation, but basically the construction in this area is permitted under the existing planning documents. From 1 January 2013, payments are charged for illegal construction, varying from LTL 300 to 500,000;
- simplified considerably the procedure for construction of small houses. Amendments to the law aim at improving business environment, encouraging market development and streamlining administrative procedures.

Another important law is the Law on Territorial Planning. New Law provides the following major regulatory changes (Sabaliauskas 2012):

- Two types of territorial planning levels (depending on the approving authority, planned size and solutions level), causing uncertainty about the primacy of territorial planning documents, will be replaced by a clear type of territorial planning level: state and municipal. The draft law clearly establishes the supremacy of the territorial planning documents and distinguishes the competence of national and municipal authorities.
- Three types of the territorial planning documents: general, special and detailed planning documents will be replaced by two types of planning documents: comprehensive territorial planning documents and special planning documents.
- The number of detailed plans currently prepared will be reduced. It is provided that the building-up plans (current detailed plans) will be developed only in the urban areas and those subject to urbanization,

and parcel plans will be replaced by the plans for larger areas. Refusal of planning documentation will save resources, improve the business environment and prevent corruption.

- Possibility to shorten the territorial planning process. Time limits for coordination, checking and approval of territorial planning documents will be set forth. It is estimated that the amount of currently developed detailed plans will reduce ~ 80%.

One of the last improvements in enhancing real property conveyance is an implemented public electronic service for real property transactions – e-conveyance service. It means that all actions related to acquisition of real property and registration of rights there to, are performed at the notary bureau without applying directly to the real property registering institution – the Centre of Registers. Real property transactions are concluded using modern electronic means, through direct electronic access to the central database of the Real Property Register. Notaries verify transaction and ownership registration documents using electronic authentication and qualified e-signature. The new system allows providing services in a more efficient way and of better quality; real property transactions have become much safer. The e-conveyance system has prevented from illegal manipulation of real property and document falsification (Sabaliauskas 2012).

At the end of 2008, the Latvian Saima approved the programme of stabilisation and revival of the Latvian economy. The programme obliged the Government to pursue a strict fiscal policy decreasing the state budget deficit, to establish the stabilisation reserve into which money could be transmitted in case the budget is balanced and the growth of the GDP exceeded 2%. The structural reforms were provided in the plan in order to decrease the expenses of public management by 15%, while financing of social protection measures would not be decreased. The Bank of Latvia was obliged to keep a fixed ratio between the latas and the euro. In line with the programme, from 2009 the Government of Latvia plans to decrease the tariff of residents' income tax by 2%, to increase the rate of the value added tax by 3%, to eliminate the majority of reduced tariffs of the value-added tax, to increase the excise duty for fuel, coffee and alcohol as well as to tax dwelling apartments of habitants from 2010. In 2010, the Latvian Government submitted a new plan of economic revival to Saima. The stimulation of export, the manufacture of home commodities for replacing import, orientation of production to manufacture commodities with high added values as well as stimulation of the sectors of economy grounded on the knowledge and innovations have been provided in the plan (Davulis 2012).

In 2008, the International Monetary Fund, the World Bank and the financial institutions of the EU granted a credit to Latvia amounting to EUR 7.5 billion (EUR 1.7 billion of which was granted by the IMF) to make reforms. Despite the

fact that the creditors fixed a low interest for credit, they required the fulfilment of strict conditions, i.e. to decrease the state budget deficit to 3% of GDP within three years, not to increase pensions, to decrease salaries, to set new taxes, to diminish governmental management expenses by 30% instead of 15% (Davulis 2012). Thus, the anti-crisis measures were similar both in Latvia and in Lithuania. The revival of economy is grounded on strict fiscal policy and saving in both countries.

Estonia began executing strict fiscal policy earlier than the other Baltic countries, i.e. before the start of the crisis. In the years of the fast economic growth that country began forming surplus state budget and accumulating fiscal reserves. The accumulated reserves allowed Estonia to avoid the necessity of borrowing in the international financial markets by paying high interest during the global crisis. Although Estonia did not have a formal anti-crisis plan, as it hoped to naturally overcome the economic difficulties, it was also forced to apply the saving mode. The Estonian Government has also adopted decisions to decrease state expenditure, especially in the sphere of health protection and education, pensions and salaries (by 15%); to increase the rate of value added tax from 18% to 20%; the excise duty on tobacco products and alcohol and to introduce new taxes. Therefore, the accumulated financial reserves permitted gaining obvious advantages for Estonia in comparison with the other Baltic countries. Despite the fact that Estonia pursued an expedient fiscal policy before the crisis and accumulated fiscal reserves, the character of macroeconomic processes in all of the Baltic countries was very similar and differed insignificantly. It is true that the accumulated financial reserves permitted Estonia to avoid additional difficulties in the sphere of public finances confronted by the Lithuanian and Latvian economies (Davulis 2012).

Also, some changes in real estate markets of the Baltic countries were influenced by introduction of euro. During the period of 2010–2014 prices of flats in Estonia's capital Tallinn increased by approximately 10.1%, in Latvia's capital Riga – by 2.3% and in Vilnius – by 5.1%.

It is difficult to estimate the effects of the discussed crisis management measures on real estate markets in the Baltic countries, but economies of the Baltic States started to recover in 2010 and recovery had positive effects on real estate markets.

2. LAND MARKETS: INNEFICIENCIES AND REGULATIONS

2.1. Peculiarities of Land Markets

Land is considered as highly important resource of production. According to Koniczna and Trystuła (2014), land is the basis of economic activities and serves as a resource which requires careful management and takes into account the welfare of future generations.

Furthermore, since each parcel of land has a precise location, access to a wide range of amenities and local public and other “non-market” goods is determined by land consumption. The evidence increasingly demonstrates that land markets are remarkably efficient at capitalising both property-related taxes as well as the impacts (both positive and negative) of regulation and local public goods and amenities. Thus, access to the amenities produced by a system of land use regulation is conditioned on land consumption; if growth boundaries produce the benefit of protected open space, for example, access to those benefits is determined by a household’s willingness (and ability) to pay for locations providing such access. Land markets have implications for welfare and social issues such as segregation going far beyond the shelter houses provide. They are tightly regulated (Cheshire, Sheppard 2004).

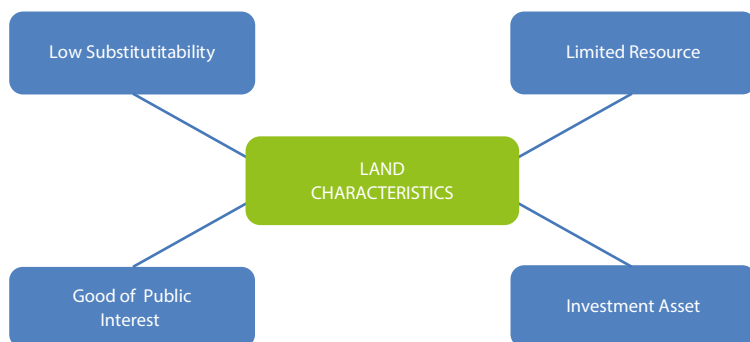


Fig. 2.1. Main characteristics of land

From the economic point of view, land comprises all naturally occurring resources whose supply is fixed. Land use is the human use of land. Land use involves the management and modification of natural environment or wilderness into built environment such as fields, pastures, and settlements.

Moreover, land has some substantial characteristics that distinguish it from “normal” or “usual” market goods (see Fig. 2.1). These characteristics were studied by Alexander (2014) and are further discussed in more detail.

Low substitutability. In general *substitutability* means ability of two or more goods to be substituted for one another. Looking at real estate market, it is possible to envisage high substitutability among apartments in multi-storeyed panel buildings, built during the period of Soviet times, but none between those new apartments built in the Centre of Vilnius. This illustrates that real estate market is highly fragmented.

Some substitutability is achievable by investing in adaptation through infrastructure development and construction but this is limited. More and better highway and transportation networks can increase substitutability by enhancing access to remoter locations, and redevelopment can enhance the quality of construction and the built environment in older or deteriorated areas. But even the best efforts cannot increase the limited supply of land and properties in special locations (Alexander 2014).

The factor that limits the substitutability of land is *location*. Location is an intrinsic attribute of all land – every real parcel or property is somewhere. Location is also its most important attribute; as the real-estate maven said: “What are the three things that count in valuing property? – Location, Location, Location” (McKenzie *et al.* 2010).

Location has two aspects: absolute and relative (Alexander 2014). Absolute location relates to the intrinsic locational characteristics of a parcel based on its physical-geographic environment. Thus the geographic location of a parcel and the topography of the site can benefit the property with unique exposures or views (Alexander 2014).

Absolute location may relate to proximate natural assets or amenities, for example Nida in Lithuania. Another aspect of absolute location is access. Traditionally, this often related to geographic location, accounting for the growth of some cities.

Relative location means the location of a parcel with respect to its present and prospective human-made environment. This relates the subject property to location of other relevant (interacting and/or interdependent) amenities, activities and land uses, often also based on the area’s transportation networking and distribution of accessibility (Alexander 2014).

Relative location reflects the intrinsic inter-dependence between properties and their land uses, which is the result of the external or “neighbourhood” effects that their uses, development, and any changes in these will have from one parcel to another. This interdependence can extend over an area or territory that, depending on the property’s intended use or function, can range from a city neighbourhood (e.g. for residential property) through a metropolitan region (e.g. for commercial uses or transportation-related facilities) and extend to transnational domains, e.g. Europe or the Pacific basin (e.g. for strategic infrastructure-related projects), which is critical in appraisal of their market value (Alexander 2014).

Location distinguishes land and property from “normal” market goods by limiting their substitutability. This is the case when unique locational attributes give landowners of such sites what amounts to a natural monopoly that puts high, sometimes almost unlimited, values on their properties (Alexander 2014).

Limited resource. From the economic point of view, land is limited as the other factors of production. However, the way in which land is a limited resource is important in distinguishing it from “normal” market goods.

Land is different from other productive resources because it is immobile, and its content is constant. Land is a finite natural resource even though the resource may change over time and under management and use conditions. Land is there, not because it is produced but because it is natural (Raslanas *et al.* 2010a). According to Manser (2010), land has cost nothing to produce and it exists, regardless of what it is used for, or whether it is used at all. Its price is not due to the costs of production, which are zero, but depends on the level of demand and limited supply. Since the amount of land on the earth’s surface remains virtually fixed, its scarcity value depends on how much demand there is. As our need for space grows, so the land, which remains the same, becomes more and more scarce.

Thus, when demand for a “normal” good or service grows (reflected in its rising price) more of it is produced; when demand for land or property – defined by its location – grows, its supply can be increased only to a limited extent (see Section 2.2 for more detail explanations).

Urban densification through intensive development and advanced technology (high-rise construction for residential and commercial uses and underground construction for transportation-related and technical facilities) can add significant quantities of additional property to the original supply. But there are limits to these tools’ capabilities to increase the supply of properties in locations that are in demand. Three constraining factors, distinguished by Alexander (2014), are: capacity limits, external-neighbourhood effects, and cost.

Capacity limits refer to the capability of a given land area in a specific location to accommodate designated functions and activities and their related effects. Reclamation and densification also have negative *external effects* (e.g. visual and crowding impacts, environmental impacts) that limit their use, especially in naturally attractive locations or culturally valued environments. Finally, the *high cost* of these tools adds to the original high value of the limited supply of land in these locations, so that the effect of the additional supply of properties on the average property value in the subject area may be negligible (Alexander 2014).

Consequently, the limited supply of land, influenced by particular location, turns real estate into an investment asset.

Investment asset. Property is an investment asset because its value is expected to rise. But rising prices for such real-estate (due to increased demand)

can only be offset a little by increasing production to put a supply of additional-substitutable property onto the market (Alexander 2014).

Land shares the characteristics of the financial assets that Buttonwood differentiated from “normal” market goods. Like these assets (such as stocks and bonds) investors often acquire property not for its use-value, but as a way to increase their wealth. Like financial assets, the demand for investment property increases with rising prices (unlike “normal” market goods, where demand falls) based on market actors’ expectations of prospective gains (Alexander 2014).

The fact that real-estate is an investment asset is responsible for speculative land markets, just like speculation in financial assets. In real-estate markets, a limited supply of valuable (and potentially even more valuable) property (sometimes even a locational monopoly) offers the opportunity for *speculative profits*. The resemblance to share speculation on the stock exchange, or “cornering” the market in copper futures, is clear (Alexander 2014).

Unfortunately, speculation is not the only negative aspect of real estate as an investment asset. There are also impacts on *social equity and distribution* (Alexander 2014). For desirable properties, their value as investment assets often exceeds their use-value, with the result that investment buyers will crowd-out potential buyers who want to use the property themselves. The division between these two forms of demand among the “haves” – those already owning the funds to acquire land and property, or with resources and access to profitable financing for investment – and the “have-nots”: individuals and households with limited means who can consequently only afford to rent housing, is not coincidental. Consequently, investment and speculative real estate markets inherently produce negative redistribution and increase social inequality and polarization.

Good of public interest. One argument for a public interest in land contends that society (not the landowner) is the legitimate owner of development rights on land or improved property, because social and public action is what creates properties’ development potential. Based on the positive externalities and neighbourhood effects of public and other private investments in creating property value, discussed under relative location above, the state has an interest in private property and deserves a share of land development rights and values (Alexander 2014).

This position also views land and development rights as a public asset with redistribution potential through appropriate public policies and programs. Planning benefit fees are one example of such redistribution; cross-subsidizing affordable housing programs through required developer contributions are another (Lerman 2006).

Also there is a public interest in land because of the significant external effects of land use and development: when these are negative they impose high social costs, which can often not be reversed or remedied. This issue was debated

in the UK in the context of the post WWII planning acts that essentially nationalized development rights, which subsequent governments relaxed and reversed in later legislation (Booth 2002).

The social cost of negative externalities is an important aspect of the land/property market that makes it unlike “normal” markets for off-the-shelf goods and services, and even unlike other markets for real investment assets such as collectibles (art, coins, antique cars, etc.) and valuables (gold bullion, diamonds etc.). In this respect the case for public intervention in this market is just as strong as that for regulating financial markets.

Furthermore, Buttonwood’s (2010) analysis of financial markets did not include their transaction costs, because they are not relevant. In terms of transaction cost theory and analysis, transactions in financial markets are simple purchases of financial instruments that are no different from buying any product. But here land/property markets are not like Buttonwood’s financial markets. Another reason why land/property markets are not like “normal” markets that work, is that the transactions here are not like exchanges in “normal” and also financial markets. Systematic analysis of their key transaction dimensions (interdependence, uncertainty and timing) reveals that they are unlike the simple transactions of the classic economic market, but more like idiosyncratic transactions that demand modified market forms of governance (Alexander 2001).

It can be summarised that land and property are not “normal” market goods, because they do not share the defining characteristics of the goods and services that are the objects of competitive market transactions. Consequently, land property markets cannot be expected to work, in the way market supporters expect markets to work, based on the premises of classic micro-economics. For this purpose main market forces of land supply and demand are further discussed in more detail.

2.2. Supply and Demand of Land. Affecting Factors

Undeveloped land, or “pure” land, refers solely to the land mass provided by nature. For example, the land mass across the earth’s surface, or more particularly the area of a local authority district, can be considered to be in fixed supply (Harvey, Jowsey 2003). The land supply curve is a vertical line on the graph where the x-axis is quantity and the y-axis is price (see Fig. 2.2).

As it was discussed before, the supply of land is fixed. Thus the price of the land is derived entirely by demand for a fixed quantum (supply) of land (Manser 2010). Hence the price is determined by the opportunity cost of different land uses (levels of demand). As levies or taxes impact on demand, supply (at the macro level) remains fixed.

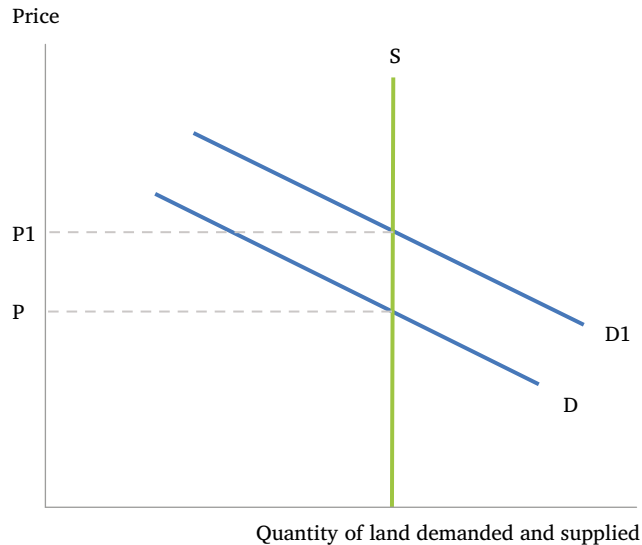


Fig. 2.2. Supply and demand for land

The fact that the price of land as a whole is determined by demand is an important point for policy makers – land will still be there no matter how high is the tax. According to Zavadskas *et al.* (2005), land value tax influences:

- Territorial planning;
- Use of land sites for construction;
- Fiscal policy;
- Land prices;
- Urban development;
- National economy;
- Social aspect;
- Environmental protection.

Municipalities lack funds for infrastructure costs in residential areas; thus they are not able to assign land for property development. The land value tax might improve funding for urban construction because it is due for payment from the moment of construction planning, regardless of construction progress. The land value tax might make planning more neutral. Introduction of the land value tax will be capitalized, and land prices will fall. This would lead to lower value increases that are determined by planning and lower profits for those owners who hold their land merely in expectation of increased future value brought by planning. Thus the impact of vested interests on territorial planning solutions would be limited, and planning would become more objective (Raslanas *et al.* 2010a).

Land intended for construction very often stands unused or underused, because the expenses of uneconomical use are not obvious. In this case, the land value tax has a positive impact, because the steady payment of it establishes the expenses of incomplete land use. This is especially true in the case of owners who fail to use their land due to unawareness or other reasons. Land use would be improved, because the land value tax is based on land value as well as on possible income in some particular territory (Raslanas *et al.* 2010a).

On the other hand, there are two important points to remember (Harvey, Jowsey 2003):

- if land is not taxed equally, the pattern of land use will be distorted; and,
- the costs of development include “normal” profit; and where tax erodes this, developers may not continue in business – the developer must be able to earn a normal profit for the role he/she plays in the development process.

Furthermore, there are some more factors that affect supply of land resources, except of taxes (see Fig. 2.3).

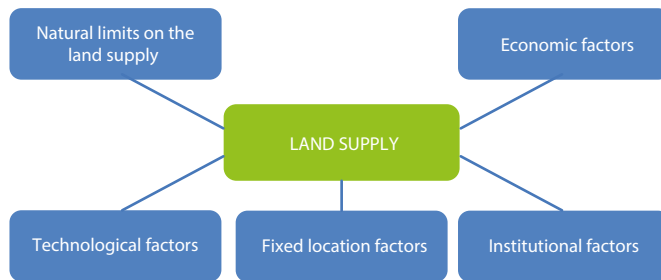


Fig. 2.3. Factors that affect supply of land

Natural limits on the land supply. These vary in terms of natural characteristics and general use capacities. The variations usually arise from differences in (Land resources analysis 2011):

- Sunlight temperature;
- Precipitation and access to water supplies;
- Topography and drainage;
- Soil conditions;
- Physical location with respect to market and transportation facilities.

However, only about 46% of the earth’s surface is covered with good soils which are suitable for crop use. Natural land characteristics have an important effect upon the economic supplies of land. They determine the physical suitability of resources for various uses (Land resources analysis 2011).

Economic, institutional, technological and field location factors usually determine the actual amount of land resources that will be used at any given time.

The usage of land resources determines its *economic importance*, compete with others for their use or control, put a price or value on them or assume the costs associated with their development.

The concepts of demand, price, cost and competition have effect upon the supplies of the various types of land resources. Man is inclined to use land resources with the highest use capacity. Competition between individuals and between land uses has effect on the land resources supplies picture (market forces).

The supply of land resources available to each individual operator is limited only by his willingness and ability to pay the going price asked for the resources he needs. Continued expansion of the high priority uses inevitably leads to a diminution of the other supplies of land resources available (Land resources analysis 2011).

As it was mentioned earlier, the quantity of land in a particular location is fixed. For example, suppose that the price of a one-acre parcel of land is zero. At a price of zero, there is still one acre of land; quantity is unaffected by price. Contrary, if the price would rise, there would still be only one acre in the parcel. That means that the price of the parcel exceeds the minimum price-zero at which the land would be available. The amount by which any price exceeds the minimum price necessary to make a resource available is called *economic rent* (see Fig. 2.4). In other words, economic rent does not arise out of the expenses of production (in the case of the field it can be argued that the landowner had to pay to acquire land, but this is not a production cost – the land would still have existed had it not been purchased. The buying price is just a transfer fee, paid to obtain a change of ownership) (Manser 2010).

The unique characteristics of land – zero production costs and a fixed supply gave a rise to the theory of economic rent, developed by David Ricardo at the beginning of the 19th century and became a staple of economic theory. Ricardo argued that the payment, or rent, charged for a piece of land had no influence on the amount of land available. The supply of land was depended on nature and the owner incurred no extra cost by allowing another to cultivate it. Any rent received was, therefore, pure profit (Manser 2010).

The law of rents rests on three assumptions (Médaille 2008):

- Land is necessary for production;
- Land has varying productivities;
- Demand is rational, informed, mobile, and driven by considerations of financial value.

The first two assumptions appear to be self-evident. The third is the assumption of the perfect market, and to the extent that it is true, the law of rents will be true. Of course, markets are never perfect, so the law of rents will never operate perfectly; nevertheless, there will always be a strong tendency for rent to absorb all increases in productivity (Médaille 2008).



Fig. 2.4. Explanation of economic rent

The impact of institutional factors. This involves cultural aspect such as custom, government, law, public opinion etc. and tenure practices the law of the land and other directives for individuals to have control, exploit, and use land resources to expand and enlarge the opportunities available to others (Land resources analysis 2011).

The proximity of certain types of land uses e.g. cemeteries, parks, may influence positively or negatively the use of nearby land. Furthermore, urban land management is a fundamental matter of local public policy, and good land management should be fostered and supported as a core skill that a local government must have (Raslanas *et al.* 2010a). For more impacts of land regulations see Sections 2.3 and 2.5 of this monograph.

Impact of technological factors. The value of land resources is directly related to people's ability to use them. The economic supplies of land resources always reflect the current level of technological development. Technological developments have impact upon the interaction of supply and demand (Land resources analysis 2011):

- Affect the nature and extent of the economic supplies of various resources by extended use of existing supplies;
- Facilitating the discovery and development of new sources of supply;
- Provides substitutes which may enhance the value of some resources and reducing the need for others;
- Provides solutions to scarce supply of land by providing the drainage and similar land recovery exercises.

The impact of the fixed location factor. As it was previously discussed, this factor limits the substitutability of land and has much influence on land value.

It should be noted that land is not in fixed supply from the viewpoint of particular use. The supply of land to a single use or to a particular industry is not perfectly inelastic (Manser 2010). The supply of land to a particular use or industry can be increased by shifting of land from other uses or industries. Thus, by offering attractive rents, the supply of land for a particular use can be increased by taking it away from other competitive uses. For example, the use of land in many countries is informed by the economics of the property market and is governed by planning policy. If demand for a particular land use is high, developers will seek to buy land with a lower existing use value for redevelopment to the higher value use. This will occur if the proposed new use has a higher residual land value than the existing use less the total costs of redevelopment (Land resources analysis 2011). In short, the higher the demand, the greater the price, the more land will usually be supplied for that particular use, i.e. there will be an upward-sloping supply curve on *Supply and Demand* chart (see Fig. 2.5).

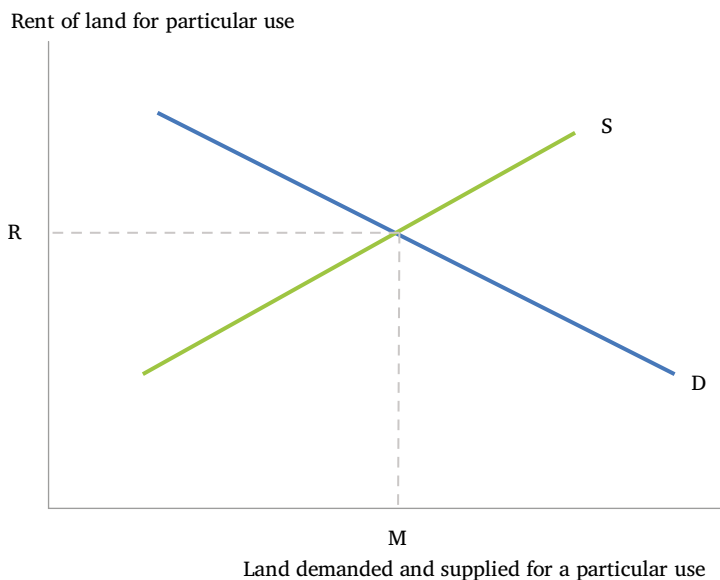


Fig. 2.5. Land demanded and supplied for particular use

Land is not substitutable. In practice land varies in quality. It has different locational characteristics, accessibility and physical conditions. It also has different town planning status and is sometimes restricted by covenants. These factors give rise to differential land values (Land resources analysis 2011).

Also changes in land supply to a different use normally take time to come through the planning and development. For example, it takes considerable time for urban extension land to be planned; receive planning permission; before building can commence (Land resources analysis 2011).

The effect of this timescale is illustrated on Figure 2.6. Price increases in the short term from P to P_1 ; but as supply increases, the price pressure reduces (P_2).

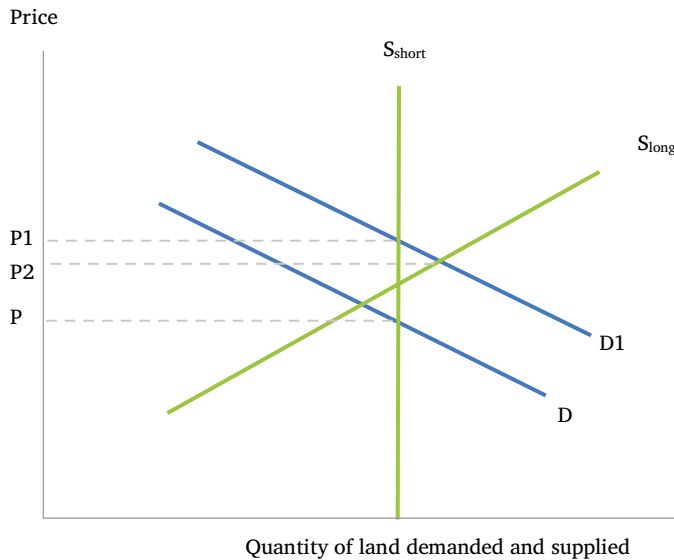


Fig. 2.6. Effect of time on supply and demand for land

In fact, this is theoretical approach. In reality the land market is not a perfect market. The time taken to achieve the “S-long” position (in Fig. 2.6) varies considerably and it may never reach equilibrium. Developers respond to the price signals from purchasers and investors, bidding up the price of land. However, the time it takes to allocate sites could itself contribute to rising land prices. Contrast is with the oversupply of previously developed industrial land where values are low due to low demand (Land resources analysis 2011).

2.3. Policies that Affect Markets for Agricultural Land

As it was previously discussed, land values are determined by demand and supply. Factors that shift the demand for and supply of agricultural land relate to competing uses for land, changes in agricultural productivity, speculative forces, the potential of land to hedge against inflation and its amenity values. Only a limited amount of land is offered on the market every year because individuals hold land for many other reasons than production, including prestige value,

lifestyle value and family traditions, and for storing wealth if confidence in money as a repository of value is low (Ciaian *et al.* 2012a). According to Huber *et al.* (2011), normally, no more than five per cent of agricultural land is on the market at any one time.

Supply and demand of agricultural land is significantly affected by institutional factors. This Section is an attempt to summarise some of these factors.

2.3.1. Effects of Agricultural Policy

Various researches (i.e. Guyomard *et al.* 2004; Ciaian, Swinnen 2006, 2009; Ciaian *et al.* 2010a, b, 2012a) have analysed agricultural policy measures that have been implemented to support farmer income in developed countries and distinguished market price support, production subsidies, factor subsidies, both coupled and decoupled payments, etc.

Studies show, that in particular, agricultural policies implemented influence (usually increase) farmer income, although they have varying effects. Different policies can be carried out to support farmer income, such as the input subsidy, output subsidy, export subsidy, decoupled payments, input quota and output quota.

According to Ciaian *et al.* (2012a), in addition to the direct effect of increasing farmer income, most of the agricultural policies carried out also induce second-order adjustments. For example, farm subsidies have an impact not only on the employed factor reward but also, through altered farmer incentives, on factor demand, inter-sectoral factor allocation and factor ownership.

If agricultural subsidies benefit landowners instead of farmers, negative side effects may arise (Latruffe *et al.* 2008; Ciaian *et al.* 2012a). For example, policy-induced growth in land values might reduce efficiency in the agricultural sector. Given that farmers must finance a higher initial investment (entry cost) and face a risk of policy changes affecting the return on that investment, the entry barrier for potential new farmers increases. The expansion costs of existing farmers also rise. Consequently, the exchange of land among different owners is reduced, pushing up the average cost of production in the agricultural sector. Furthermore, depending on the exact implementation mechanism, the benefits of support may accrue only to those who are landowners at the time the support was introduced. Later entrants, who have purchased land at higher prices, may benefit less from the policy support. This implies that many active farmers do not receive any or receive only a fraction of the benefits from subsidy support. Moreover, it implies that if the policy goal is intergenerational equity, support levels will have to be increased in the future, further inflating land values and entering into a spiralling circle of subsidy support that could not likely be continued forever (Ciaian *et al.* 2010a, b, 2012a).

Finally, future reform efforts to reduce support might be rendered more difficult because of the potential impact on land values. Expectations about the level of subsidy support in the future play an important role in the determination of land values. When agricultural support policies become capitalised into land values, existing landowners may resist future policy reforms because of vested interests (Ciaian *et al.* 2012a).

Thus, to understand the effects of the agricultural policy on land markets, a detailed knowledge about the policies and about the underlying mechanism through which agricultural subsidies are capitalised into land values and farmland rents is required.

The classical model for analysing the income distributional consequences of agricultural support policies was presented by Floyd in early 1956 (Floyd 1956). Author considered three price-support programs where output is alternatively: not controlled; controlled by acreage restrictions; or controlled by restrictions on the quantity of produce that farmers can market. He assumed one land and one non-land (labour and capital) input and these inputs were combined in a constant return-to-scale production function. In his model, output market clearing and input market clearing determine the output and input prices.

The main findings of the theoretical literature on coupled policy impacts were summarised by Ciaian *et al.* (2012a) as follows:

- If the land supply is fixed, then area payments are fully capitalised into land values;
- Coupled production subsidies are fully capitalised into land values if in addition to zero land supply elasticity, either the supply elasticity of non-land inputs is perfectly elastic or factor proportions are fixed;
- In other situations, the benefits from coupled subsidies are shared between land and other production factors and if demand elasticity is not perfectly elastic, the consumers too;
- The agricultural policy impact on land values may be very large (e.g. fully capturing the subsidies).

More recently, a new generation of partial and general equilibrium models have been developed to analyse the impact of decoupled subsidies. The majority of these models are based on behavioural models of profit maximisation (i.e. Guyomard *et al.* 2004; Ciaian, Swinnen 2006).

The main findings of the theoretical literature on decoupled policy impacts can be summarised as follows (Ciaian *et al.* 2012a):

- Fully decoupled farm policies have no impact on land values if markets are perfect;
- Decoupled policies may affect land values only in the presence of (some) market imperfections (such as transaction costs or credit constraints in the land market);

- The exact impact depends on many factors, such as the type of policy, supply and demand elasticities, accompanying policy measures, market imperfections, land use opportunity costs, institutions and expectations.

The outcomes of the policies implemented in terms of income distribution are affected by many aspects. Policy-related factors (determinants), according to Ciaian *et al.* (2012a) are the policy type, the implementation details and accompanying measures.

Because an area subsidy is directly linked to the land market, it is expected to have a stronger influence on land values than an output subsidy. It decreases farms' land costs, which in turn increases the demand for land. A land subsidy solely decreases land costs, whereas the rest of input costs are not affected. Higher land demand in turn exerts upward pressure on land prices. In contrast, an output subsidy affects land prices indirectly through higher profitability of agricultural production. Directly, it affects the output market and hence consumers' welfare. Indirectly, an output subsidy increases demand not only for land but also for all farm inputs. Thus, it affects the marginal profitability of all farm inputs equally. As a result, the effect of the subsidy is shared equally among all inputs (OECD 2007, cited from Ciaian *et al.* 2012a).

The capitalisation rate of subsidies also depends on the policy implementation details. Benefits may flow to landowners but may not be capitalised into land values if they are not expected to continue in the future. On the other hand, benefits may be capitalised effectively into land values even if the benefits themselves do not flow to land per se.

In the real world, agricultural support policies are combined in policy programmes involving multiple instruments working at the same time, none of which can be considered isolated from the others. Thus, even when farm payments are fully decoupled, whether the payments are fully reflected in land rents or capitalised into land values may depend on other policy instruments. For instance, decoupled payments and area payments may be subject to cross compliance, set-aside or other requirements. If area payments are subject to cross compliance, then their effect on land values is mitigated because eligibility for the subsidy requires farmers to incur certain costs (Ciaian *et al.* 2010a, 2012a).

The empirical researches to estimate the impact of agricultural support policies on land markets can be grouped into two categories:

- land rent studies (e.g. Lence, Mishra 2003; Roberts *et al.* 2003; Kirwan 2005 – for the USA, and Patton *et al.* 2008; Killian *et al.* 2008; Ciaian, Kancs 2009; Ciaian *et al.* 2010a, b; Breustedt, Habbermann 2011 – for EU countries);
- land value (price) studies (e.g. Gardner 2002; Goodwin *et al.* 2003; Taylor, Brester 2005; Taylor 2013 – for the USA, and Duvivier *et al.* 2005; Latruffe *et al.* 2008 – for EU countries).

In addition to the general agricultural policies, other policies, such as rural development programmes and environmental policies, may affect land markets.

2.3.2. Policies and Problems in the New EU Member States

In the new member states (NMS), including Lithuania, land markets have been strongly affected by EU accession in two common ways. First, when the NMS acceded to the EU, agricultural subsidies were significantly increased and were, at least partially, capitalised into land prices (Ciaian *et al.* 2012a).

EU accession affected the NMS rural land markets indirectly, through various interactions. Most importantly, EU accession affected the NMS land markets through the following channels (Swinnen, Vranken 2009):

- It improved the functioning of other factor markets (including credit and technology) and of output markets. With improvements in these other markets, farms' productivity, investments and profits grew, leading to an increase in land demand and land values in NMS.
- It stimulated foreign and domestic investments in the food industry and agribusiness, with important spillovers on farming and land. These spillover effects implied major positive impacts on productivity, investments, and competitiveness of the whole agri-food chain, including agriculture.
- It led to a strong increase in subsidies for NMS farmers through the Common Agricultural Policy (CAP). While NMS farms only get part of the subsidies that EU15 farms get for a transition period the subsidies were an important share of NMS farm incomes. Moreover, since most of the subsidies are either linked to output or to land, they land prices to rise.

The combination of these factors led to a strong increase in farm incomes, in land transactions and land prices with EU accession.

Second effect of transition was linked to restrictions of acquisition of land by foreigners. During the accession negotiations, candidate countries requested the possibility to maintain existing national provisions restricting the acquisition of agricultural land or forests by foreigners. They considered these derogations necessary in order to protect the socio-economic agricultural structure of the countries from shocks that might arise from the differences in land prices and income with the rest of the union, and to be able to pursue an effective agricultural policy. The derogations were also deemed necessary due to an unfinished process of privatisation and restitution of agricultural land to the farmers in some countries. Some candidate countries provided detailed arguments justifying the transitional periods in the framework of the Common Positions expressed by the Council during the negotiations (Swinnen, Vranken 2009).

Therefore, foreigners have been unable to purchase agricultural land during a transitional period of seven years after EU accession in Bulgaria, the Czech

Republic, Estonia, Hungary, Latvia, Lithuania, Romania and Slovakia, and 12 years for Poland. There are differences among the countries in the implementation of these restrictions, for example in the way “foreigners” are legally defined and in the conditions they must fulfil to (exceptionally) obtain agricultural land. These differences usually stem from the fact that the various restrictive regimes existing before accession were permitted to continue during the transitional period (Ciaian *et al.* 2012a).

Effects of transitional restrictions were in detail analysed by Swinnen and Vranken (2009), Ciaian *et al.* (2012a, b) and other authors.

Swinnen and Vranken (2009) in their final report first of all raise a question on how these transitional restrictions really affected the efficiency of land exchanges and land allocations, and of productivity growth in NMS. The impacts can be analysed through comparison of efficiency of land sales and rental transactions.

The restrictions that have been imposed by the NMS concern restrictions on ownership of agricultural land by foreigners; however, they do not constrain foreigners in accessing land through renting land.

Land renting is a very important form of agricultural land transaction in many developed countries, including the US and several EU15 countries, where sometimes more than half of all agricultural land is rented by the farms, although there are large differences between countries. Among the EU15 Member States, there is an important variation in the importance of land renting. For example, in Belgium, where tenants are highly protected by the land rental policy, almost 70% of the cultivated land area is rented, while in Italy, where the policy is aimed at stimulating owner-cultivation, only 26% of the cultivated land is rented (Swinnen, Vranken 2009).

Land renting is also very important in NMS agriculture, and with even larger variation among countries. In the Slovak and Czech Republics, e.g., around 90% of the cultivated land area is rented. In Hungary, Estonia and Lithuania, between 50% and 60% of the cultivated area is rented. In Latvia and Poland, this number decreases to around 25% of land is often considered a superior form compared to land rental (Swinnen, Vranken 2009).

The arguments supporting the optimality of land sales are as follows (Binswanger *et al.* 1995):

- Land sales transfer full rights to the new user;
- They are more likely to increase access to credit as owned land can be used for collateral purposes;
- They provide optimal incentives for investment by providing permanent security of rights.

However, these conclusions rely on a number of simplifying assumptions that are not always consistent with reality, and especially not with reality in

transition countries – or in the EU for that matter (Swinnen, Vranken 2009).

Imperfections in input, product, credit and insurance markets all affect the functioning of land markets. Credit or capital market imperfections play a particularly important role, and particularly so for land sales transactions. Finally, people hold land for many other reasons than production, such as prestige value, lifestyle value and family traditions, leading wealthy and politically connected households to accumulate large tracts of land. Some of these factors also make the sale price of land typically higher than the productive value of land (Swinnen, Vranken 2009).

All this has important implications for efficiency. An efficient land market would transfer land from less to more productive users of the land. The arguments raised above imply that it is expensive and difficult for efficient producers to buy land; they also reduce the attraction for less efficient producers to sell their land. These factors imply that land markets require a premium over their expected production value to be included in the sales prices. As these constraints on the land market limit the transfer of land from less efficient to more efficient users, efficiency losses are incurred. For example, as transaction costs in land sales are large, owners and farmers have a difficult time adjusting their land to their other production factors, and to changed market conditions (Ciaian *et al.* 2012a).

This leads to sub-optimal land allocation (Swinnen, Vranken 2009). Similarly, as owners hang on to land for reasons of speculation, insurance or wealth hoarding, land will not be used in the most productive way.

In such environments, land renting may have advantages over sales:

- It allows more flexible adjustments of the land area used with relatively low transaction costs;
- It requires only a limited capital outlay, thereby leaving more liquidity available for productive investments rather than locking it all up in land;
- It facilitates easy reallocation of land towards more efficient users than the current owners; and
- It could provide a stepping stone towards increased land use and ownership by the poorest.

These factors were highly relevant for the NMS in the 1990s. Transaction costs for land sales were very high during the transition period, if sales were permitted at all.

Also, flexible exchange options were particularly important in conditions of uncertainty. During the transition, farms and land owners were often uncertain about how market conditions would evolve, and how institutions and laws would evolve. In such conditions flexible and short-term rental contracts may be better choices than sales or long-run contracting – for both sides of the transaction (Ciaian *et al.* 2012a).

Rental markets are not perfect. There can be problems with a) investment incentives because of the lack of long run security, b) access to credit as one cannot use rented land as collateral, and c) segmentation of land rental markets with insecure property rights (Ciaian *et al.* 2012a).

Several of these potential problems depend strongly on the nature of the rental contracts, on the institutional environment affecting property rights and enforcement costs, and on government regulation of rental contracts. For example, in several West European countries, governments have therefore introduced legislation to guarantee a minimum length of rental contract of several years in order to guarantee tenants sufficient security of land operation. However, problems of overregulation have occurred (Swinnen, Vranken 2009).

The investment disincentive effect depends importantly on the nature of the required investments, and one should expect the length of the investment depreciation to be correlated to the length of tenure security required. This is one factor that explains why farms may prefer a combination of owned land and rented land (Ciaian *et al.* 2012a).

One of the main advantages of rental rather than sales transactions in capital-intensive agricultural systems – such as in the EU and the US – is that with the possibility of using other assets as collateral, farms prefer to invest in new technology and farm-specific assets rather than tying up large sums of capital in land purchases. Many farms use both owned land and rented land in their operations. According to the US Department of Agriculture, commercial farms rent on average about half of the land they use in the US. In Western Europe, many farms both own and rent land, and the proportion of such mixed land use increases with the size of the farm (Swinnen, Vranken 2009).

In this way, farms in these countries combine tenure security (with their assets and long-term investments concentrated on owned land) and flexibility in land allocation on the one hand, with freeing up capital for other investments (by renting additional land rather than buying) on the other hand (Ciaian *et al.* 2012a).

In addition to market imperfections, there are other constraints that impede both land sales and rental transactions in NMS, and hence reduce the potential to transfer land from the least to the most productive users and prevent the efficient allocation of agricultural land. These constraints are summarised in Figure 2.7 and further discussed in more detail.

Unfinished privatisation/ unresolved ownership. A substantive share of agricultural land is still owned by the state and may be subject to future privatisation and restitution. The current decision-making and uncertainty about future ownership has an effect on the (lack of) transactions associated with such land and its use (Ciaian *et al.* 2012a). Evidences from some NMS are presented in Table 2.1.

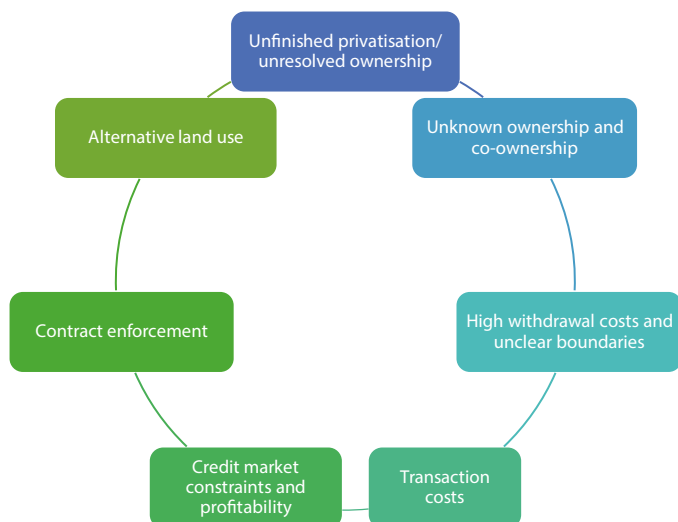


Fig. 2.7. Constraints that impede land sales and rental transactions in NMS

Unknown ownership and co-ownership. In many NMS, land ownership registration was poorly maintained, if at all, and in many areas land consolidation was implemented, wiping out old boundaries and relocating natural identification points (such as old roads and small rivers). Thus, the loss of information on registration and boundaries produced a large number of unknown owners. In addition, unsettled land inheritance within families during the socialist regime caused a strong land ownership fragmentation and a large number of co-owners per plot of land (Swinnen, Vranken 2009).

In Slovakia, for instance, in 2003 there were approximately 9.6 million registered plots, of roughly 0.45 ha per plot, and each plot was owned on average by 12 to 15 persons. In the Czech Republic, there were 4 million ownership papers registered in 1998 for 13 million parcels, with an average parcel size of 0.4 ha (Ciaian *et al.* 2012a). Many of these co-ownership issues still have not been resolved. In Bulgaria, the average size of an agricultural plot is 0.6 ha, ranging from 0.3 ha in the Smolyan region to 3.0 ha in the Dobrich region. This high level of land fragmentation affects the sales market because buyers are more reluctant to buy dispersed parcels of land (Kopeva 2003).

Land use fragmentation, together with the application of different cultivation procedures and treatments on neighbouring parcels, has a negative impact on the quantity and quality of output. These factors raise the costs of land exchanges, for both sales and rentals, as land withdrawal from the corporate bodies normally requires agreement from the co-owners (Ciaian *et al.* 2012d).

High withdrawal costs and unclear boundaries. As a consequence of the privatisation and land reform process in the early 1990s, which restituted land to

its previous owners (or heirs), there are important transaction costs in the form of high withdrawal costs and unclear boundaries related to the agricultural land market (Ciaian *et al.* 2012a).

Table 2.1. Unresolved privatisation issues in NMS countries (created by authors, on the basis of findings by Swinnen and Vranken (2009), Ciaian *et al.* (2012a, b))

Country	Evidences of unresolved privatisation
Poland	The agricultural property agency still owns around 3 million ha of agricultural land, corresponding to 19% of all agricultural land in Poland. Since 1997, there has been a ban on the sale of state property claimed by former owners or their successors, so around 0.5 million ha of land (or 18% of the agricultural land owned by the agency) has been withheld from the sales market.
Czech Republic	About 0.45 million ha (or 13% of the Czech utilised agricultural area, UAA) remained under the administration of the land fund in 2007, although around 0.26 million ha of this will be privatised in the near future.
Lithuania	The share of privately-owned land increased by more than 60% from 2000 to 2006. About 1 million ha of land was privatised from 2002 to 2006. By the end of 2011, an additional 0.9 million ha will have been privatised by restoring ownership rights or selling state-owned land to its users.
Slovakia	The state owned 13,816 ha (or 7% of the UAA) in 2006 while the owners of a further 437,665 ha (23% of the UAA) were not known.
Hungary	The state owned 2 million ha (around 22% of the total agricultural land) in 2006. Currently, it is managed by the national land fund, which rents it out on a long-term basis. But according to the land policy, it might be subject to privatisation.
Estonia	The land reform and privatisation process is basically completed. Unfortunately, the cadastral register has information on 83% of the total agricultural area.
Bulgaria	Approximately 240,000 ha of agricultural land (8% of the UAA) are owned and managed by the state land fund.
Romania	Approximately 1.6 million ha (or 12% of the UAA) remain in state and municipal ownership and will be rented out to private operators.

Interviews with country experts confirm that the difficulty of withdrawing land is highly dependent on the location of the plot. The withdrawal of a plot that is situated in a consolidated field makes the process more problematic and costly. The cooperative farm and the landowners have to agree on the physical demarcation of the plot. If the plot is located in the middle of a consolidated

field, they will typically try to agree on a comparable parcel along the border of that field. In this context, it is important that the farm management is accommodating in relation to the withdrawal procedure (Ciaian *et al.* 2012d).

According to the legislation, corporate farms have no right to block such withdrawals. Yet in practice, they are not always so supportive. Although the difficulties between the withdrawal of physical land plots and land shares are not that dissimilar, there are indications that the withdrawal of land shares is even more challenging, especially for land owned by individuals who are not connected with the corporate farms (non-members/non-partners). In general, these problems increase the costs for the landowner, since s/he can be deterred from withdrawal by being offered a plot located far from his/her operation or a plot of lower soil quality (Ciaian *et al.* 2012d).

Transaction costs. Several studies document that land markets in the transition countries, even the most advanced such as in Central Europe, were characterised by the existence of significant transaction costs in the rural land markets, constraining land exchanges in the years leading up to EU accession (i.e. Lerman *et al.* 2004). Transaction costs include: bargaining costs, costs of enforcement of withdrawal rights, costs related to asymmetric information, costs related to co-ownership and unknown owners, and unclear boundary definitions. Uncertainty and high costs in the identification of land property rights may lead to important transaction costs and constraints on land transactions (Swinnen, Vranken 2009).

Swinnen and Vranken (2009), Ciaian *et al.* (2012a) distinguish two types of transaction costs:

- 1) “Explicit” transaction costs, which are the administrative costs associated with renting or buying a plot of agricultural land. These costs include registration costs, notary fees, etc. In general, these costs are more prevalent in the sales market.
- 2) “Implicit” transaction costs associated with renting and buying agricultural land. These costs include search and negotiation fees. Such costs are especially widespread in the land markets of the NMS, which are characterised by severe land market imperfections owing to the dominance of large-scale corporate farms.

Explicit taxes on the sale and purchase of agricultural land may affect land supply and demand, and hence also the price of agricultural land. High costs associated with transacting land are expected to hinder structural change in the agricultural sector as they limit the reallocation of land from less productive farms to highly productive farms. On the other hand, when there are only low costs associated with the purchase of agricultural land, it is possible that there may be more purchases for speculative purposes by non-agricultural investors (Ciaian *et al.* 2012d).

Most countries have a registration tax if land is purchased, but there is large variation in the magnitude of this tax among countries; in some of the 'Old member states', this tax rate can amount up to 18% of the purchase value of the plot (like Italy), while it is substantially lower in the NMS, for example 0% in Bulgaria and Slovakia (Ciaian *et al.* 2012a).

In addition to the registration fee, there are other costs associated with the transfer of agricultural land, such as notary fees and other taxes and administrative charges. When taking these costs into account, land transaction costs in the NMS are relatively high compared with the OMS, ranging between 10% and 30% of the value of the land transaction (Swinnen, Vranken 2010). For example in Poland, buying (selling) land is connected with several costs. These are related to the civil law action tax, legal costs (for a motion to set up a mortgage register and registration), notary fees and additional expenses (remuneration for an intermediary or assessor).

Although explicit transaction costs tend to be more significant in the sales market for agricultural land, there may also be transaction costs in the rental market. Usually, a rental contract is a mutual agreement between two parties, but in some cases it needs to be registered. This can be on a voluntary basis, as is the case in France, Ireland and Italy, or it can be mandatory, as in Germany, the Netherlands and Hungary. Furthermore, there are also contracts that need to be certified by a notary, such as long-term (>12 years) rental contracts in France and long-term contracts in Bulgaria (Ciaian *et al.* 2012d).

In the NMS, especially, there are high implicit transaction costs, which are closely related to the privatisation and land reform process that began at the start of the 1990s. There are three important implicit costs associated with this process (Ciaian *et al.* 2012b, c):

- imperfect competition in the land market;
- imperfections in property rights (such as unresolved ownership and co-ownership);
- high withdrawal costs and unclear boundaries.

Effects of these costs were previously discussed.

Transaction costs generally lead to lower land prices, while the general agricultural policy may reverse this effect, given that subsidies are capitalised into land prices and lead to higher prices. As long as there is competition between corporate farms and individual farms, the dominance of the land market by corporate farms and transaction costs will not affect the fact that subsidies are capitalised into land prices. When agricultural subsidies are distributed unequally, however, for example because small farmers have problems in fulfilling the requirements for obtaining subsidies, small farmers may even be net losers from the subsidies, while large corporate farms may gain, as well as landowners (Ciaian, Swinnen 2006).

Credit market constraints and profitability. Poor access to capital is a major constraint, not just for land sales markets but also for land rental markets. Lack of farm profitability and imperfect credit markets both constrain farms' access to capital. Studies of literature reveal that capital market imperfections may restrict the development of land sales markets in several ways (Ciaian, Swinnen 200; Ciaian *et al.* 2012a):

- where capital markets work imperfectly, land purchases typically have to be financed out of own savings;
- where financial markets do not work well, or where confidence in money as a repository of value is low, land may be used to store wealth and may be acquired for speculative purposes;
- land may be purchased or held as a hedge against inflation, or as an investment asset in the absence of alternative investment or hedging options;
- with constrained access to credit, investment in land ties up much needed capital in land, and prevents farmers from using these savings for investment in technology, equipment or quality inputs.

Aforementioned factors mean that the sale price for land will typically be higher than the productive value of land (Ciaian *et al.* 2012a).

It is well known that imperfections in rural credit markets have been widespread in transition countries, especially during the 1990s. These problems have been mitigated substantially with EU accession, because credit from banks and other rural financial institutions, along with contracts with agribusinesses, have reduced credit constraints for farms (Ciaian *et al.* 2012a). But in many poorer transition countries these constraints remain very important. In addition, farms' access to credit is constrained in the old member states as well (see e.g. Blancard *et al.* 2006 for case of France).

There is an interaction between credit market imperfections and agricultural policy as well (Ciaian, Swinnen 2009). When farms are credit-constrained, the introduction of agricultural subsidies will lead to a higher level of capitalisation of payments than if the farm is not credit-constrained. This is because the subsidies will reduce the farms' credit constraints, and thereby increase the marginal productivity of land and thus land demand.

Contract enforcement. In most countries, legal contract enforcement involves a costly and lengthy procedure. First, there are administrative costs. Second, if an expert opinion is required there are costs for an authorised expert. Third, in some countries like Germany, court action also requires that both parties need to have a legal adviser, which is also costly (Ciaian *et al.* 2012d).

In this regard, EU accession has also had a major effect on rental markets in the Central and Eastern European accession countries (Ciaian *et al.* 2012a). The combination of improved security of tenancy and ownership rights and improved

legal frameworks for transactions has resulted in an inflow of foreign capital into the land markets directly or indirectly through agri-food industry investment.

Alternative land use. Usually, land can be used not only for agriculture but also for other sectors of the economy. If there is such an opportunity, land values will reflect this potential, alternative land use. In a competitive market, land values reflect returns from the most profitable use of land. If the most profitable use of land is non-agricultural, e.g. urban housing, then land values will be determined by the profitability of urban housing. If, however, the non-agricultural use of land is expected to be profitable in the future, then the current land price will reflect the sum of the discounted stream of rents from agriculture up to the time of conversion plus the discounted stream of expected rents from non-agricultural use from that time onwards. These assumptions were proved by the model developed by Plantinga *et al.* (2002).

Moreover, there is evidence of speculation based on changes in land use, and for example in Greece, Spain and Bulgaria, plots close to coastal areas are more expensive than plots in more remote areas, since they are often used for non-agricultural purposes (e.g. for tourism or residential development). Also in Ireland, experts believe that non-agricultural use (residential and public infrastructure) was a main driver behind the price increase of agricultural land in the 1990s. In the Netherlands, a highly urbanised country with an extremely dense population, land prices are influenced by the implicit 'call option' that is embedded in the land price. This call option is the chance to develop agricultural land outside agriculture and depends on the probability that this transformation becomes possible. Land close to urban areas should carry a higher premium than peripheral land. Dutch zoning regulation classifies land into sectors with regard to future land use, ranging from land ready for development (red label) to regular agricultural land without development prospects (green label). The option value follows along the lines of this classification (Ciaian *et al.* 2012a).

2.4. Land Use Policies and Housing Prices

Prescriptive land use regulations include measures such as urban growth boundaries, large areas declared off-limits to development, building moratoria, population limits, unit construction limits, expensive unprecedented impact fees, excessively large minimum lot sizes and other restrictive strategies. Prescriptive land use regulation allows development only prescribed under strict conditions that are consistent with stringent land use plans and policies (Demographia 2015).

Considerable econometric and other empirical research has examined the association between prescriptive land use policies and higher house prices. The research indicates that stronger land use regulation is sometimes associated with

higher house prices. Furthermore, even comparatively modest house price differentials can have a significant effect on a community and its inhabitants. Brookings Institution economist Anthony Downs (1994) notes that even a modest 10% increase in house prices makes it impossible for 4% of household to purchase a home, and concludes such an effect to be “socially significant” (Demographia 2015).

One literature review lists more than 25 studies over a period of 30 years, all of which indicate a potential for association between stringent land-use regulation and higher house prices (Quigley, Rosenthal 2005). The extent to which house price increases are associated with land use regulation varies. Research has associated as much as 90% of average overall house price increases with prescriptive land use regulation (Eicher 2008b), with house price differentials of up to 54% and new house price differentials of up to 61% (Downs 1992) in the USA.

Research on prescriptive land use regulation and its association with higher house prices can be divided into the following sections (Demographia 2015):

- Price research by central and reserve banks and international organizations;
- Academic price research;
- Research on price volatility and speculation;
- The principle of competitive land supply;
- Research on the housing bubble and prescriptive land use regulation;
- Research on prescriptive regulation and metropolitan economies.

The association between prescriptive land use regulation and higher house price has been examined by a number of economists associated with national central and reserve banks and international organizations (Demographia 2015).

United Kingdom government reports by Barker (2004, 2006), then a member of the Monetary Policy Committee of the Bank of England, blamed that nation’s loss of housing affordability on its prescriptive land use policies under the Town and Country Planning Act of 1947.

A New Zealand government report by Grimes (2007), Chairman of the Board of the Reserve Bank of New Zealand blamed the loss of housing affordability in the nation’s largest urban area, Auckland, on prescriptive land use policies. He found that per-acre prices just inside Auckland’s urban growth boundary were 10 times that of comparable land on the other side of the urban growth boundary.

Reserve Bank of Australia governor Glenn Stevens told a parliamentary committee that “An increase in state government zoning regulations is a significant factor driving up the cost of housing.” He also noted the increase in local and state government levies on new developments as a driver of higher housing prices. In a 2011 parliamentary committee appearance Stevens (2011) said: “How is it that a country of our size – we are not short of land – cannot add to the dwelling stock for the marginal new entrant more cheaply than we seem to be able to do? I cannot get past that basic question. But – without denying that interest rates have an effect on the housing market, obviously – it seems to

me that this goes to a whole group of things on supply, zoning, transportation, infrastructure et cetera. He added a note of caution: “There is a very big inequality between generations that is building up. I think that is a social problem as much as an economic one”.

The reference to reluctance to release new land refers to the practice of Australian land use authorities to allow insufficient amounts of land to be developed to maintain the competitive land supply, while “paying for services up front” refers to the practice of requiring excessive development impact fees as a condition of building new houses.

Former Reserve Bank of New Zealand governor Donald Brash (2008) wrote that the affordability of housing is overwhelmingly a function of just one thing, the extent to which governments place artificial restrictions on the supply of residential land.

An analysis by the Federal Reserve Bank of Dallas (2008) notes the association between metropolitan area house price increases in the 2000–2006 housing bubble and the presence of prescriptive land use regulation. The analysis notes that in the responsive markets of Atlanta, Dallas-Fort Worth and Houston, flexibility with respect to housing supply spared those metropolitan areas the price increases that occurred in prescriptive markets.

A report by the Organization for Economic Cooperation and Development (OECD 2005) provides further evidence of the association between prescriptive land use regulations and higher house prices. The OECD noted that House prices can also be affected by other features that are particular to this market. Of note are restrictions on the availability of land for residential housing development that can constrain the responsiveness of supply. These would include tough zoning rules, cumbersome building regulations, slow administrative procedures, all of which would restrict the amount of developable land.

The report highlighted the experience of the United Kingdom, consistent with the conclusions of the Barker’s (2008) report. In the United Kingdom, complex and inefficient local zoning regulations and a slow authorisation process are among the reasons for the rigidity of housing supply, underlying both the trend rise of house prices and their high variability.

In the same report OECD (2005) notes the substantial differences in housing affordability between US markets. The OECD associates more restrictive land use regulation with less affordable housing in California, New Jersey, Massachusetts, New Hampshire and the Washington DC area. The OECD also shows Texas (which has responsive land use regulation) as having superior housing affordability.

OECD (2011) review of international housing markets noted that poorly managed housing markets played a key role in triggering the recent global financial crisis and may be slowing the recovery. OECD also expressed concern about

planning regulations that drive up prices lead to greater price volatility, and recommended that nations to increase responsiveness of new housing supply to market demand and noted further that nations should reassess licensing procedures that limit new housing starts and reconsider land-use regulations that unduly prevent development. More responsive supply can limit price volatility, excessive price increases and encourage labour mobility. This advice was particularly directed at the United Kingdom and Australia, which are dominated by stringent land use regulation.

World Bank Economist Mayo (2007) indicated that house prices in enabling cities with stricter regulatory policies have risen in relative terms some 30 to 60% over a 15-year period. He further noted that relative shifts in housing costs are in some cases equivalent to doubling potential residents' combined federal and state income tax, creating powerful disincentives for moving and for the functioning of labour markets. These and similar findings suggest that systematic policy mistakes have been made, that their costs have been high, and that it is time for a general change in thinking about the aims and instruments of land and housing policy.

There has also been considerable academic research on the association between prescriptive land use regulation and higher house prices, especially in the USA. Main findings are summarised in Table 2.2.

Table 2.2. Impacts of land use regulations on higher house prices

Author	Country	Description of impact
Hall <i>et al.</i> (1973)	England	Land prices were probably the largest and most potent element of Britain's postwar inflation. Planning system has imposed the greatest burdens on lower income households.
Fischel (1995)	USA (California)	Stronger land use regulation in California in the 1970s made house prices relative to median family incomes 29% higher than in the rest of the nation. By the end of the decade, California house prices had escalated to more than 75% higher in relation to incomes of this in the rest of the nation and by 1990 the difference had expanded to approximately 120%.
Malpezzi (1996)	(56 metropolitan areas)	Analysis indicates a 51% house price premium in the highly regulated metropolitan areas. Moreover, building permits in such areas tend to be approximately 40% lower than would have been expected.
Downs (1992)	USA (San Diego)	The mere establishment of an urban growth boundary is not associated with higher house prices, but that if the urban growth boundary is tightly drawn and strongly enforced in an environment of strong demand, an association with higher house prices can be expected.

Author	Country	Description of impact
Green and Malpezzi (2003)	USA	Regardless of the index used, increased levels of regulations bring about higher house prices. There is a strong association between more restrictive land-use regulations, higher house prices, higher rents, and diminished home building.
Saks (2005)	USA	In an equal demand shock “places with more regulation” experience a 17% smaller expansion of the housing stock and almost double the increase in housing prices.
Krugman (2005, 2006)	USA	The house price bubble had been limited to metropolitan areas with strong land use regulation.
Gyourko and Summers (2006)	USA (Philadelphia)	Larger lot price increases are associated with more extensive land use regulation. More restrictive land use regulation was associated with at least 70% higher relative areas with less stringent regulation.
Glaeser <i>et al.</i> (2005)	USA	Differential between replacement costs and house plus land costs are greater where there is stronger land use regulation. In the places where housing is quite expensive, zoning restrictions appear to have created these high prices.
Glaeser <i>et al.</i> (2006)	USA	Prescriptive planning recommended strategy of large lot or rural zoning can be associated with substantially higher house prices, by excessive consumption of land available for development. House prices had been inflated 60% by such planning induced scarcity.
Brueckner (2007)	USA	An urban area with an urban growth boundary (UGB) will tend to have higher housing costs and says that unless there are offsetting benefits, a UGB land-use intervention that makes consumers less well off.
Eicher (2008b)	USA (Washington)	In examination of five municipalities in the state of Washington, Eicher associates approximately 90% of the increase in house prices to land-use regulatory factors both in a sample of five Washington municipalities. Eicher’s data also indicates that approximately 87% of house price increases in 250 US municipalities was associated with more stringent land use regulation.
Cheshire (2009)	USA	Prescriptive land use regulation (which he refers to as urban containment) is incompatible with housing affordability and price stability.

In addition to the association between prescriptive land use regulation and higher house prices, economic research has indicated an association between greater price volatility and prescriptive land use regulation as well as

an association between more intense speculation and prescriptive land use regulation.

The Federal Reserve Bank of Dallas (2008) associates the rising prices from prescriptive land use regulation with higher levels of real estate speculation, which drives prices even higher. These price increases then fed off themselves. Rising prices – whether for gold, corn or houses – often foster a bubble mentality, contributing to speculative demand. Prescriptive land use regulation is also associated with more volatile prices. Prescriptive land use regulation brings more chaotic “boom and bust” cycles to housing markets.

This is noted by Glaeser *et al.* (2008), who summarize the findings of a number of studies: “Recent research also indicates that house prices are more volatile, not just higher, in tightly regulated markets....price bubbles are more likely to form in tightly regulated places, because the inelastic supply conditions that are created in part from strict local land-use regulation are an important factor in supporting ever larger price increases whenever demand is increasing. Finally, they note that housing bubbles generally do not occur in responsive markets (Demographia 2015).

It is more difficult for house prices to become too disconnected from their fundamental production costs in lightly regulated markets because significant new supply quickly dampens prices, thereby busting any illusions market participants might have about the potential for ever larger price increases (Demographia 2015).

Malpezzi and Wachter (2005) conclude that speculation is largely limited to where there are significant supply constraints. They conclude that the effects of speculation appear to be dominated by the effect of the price elasticity of supply. In fact, the largest effects of speculation are only observed when supply is inelastic. Furthermore, in analysis of Korean housing markets, Malpezzi (2005) notes, that speculation is more a symptom than a cause of a poorly performing housing market.

On the other hand, proponents of prescriptive land use regulation have generally contended that it is not associated with higher house prices (Demographia 2015). Research is cited to support this position is described below.

The work of Nelson *et al.* (2008) for the Brookings Institution has been frequently cited by advocates of smart growth to demonstrate that house prices are not associated with stronger land use regulation. Nelson *et al.* (2002) find no association between Portland’s strong urban growth boundary and house price increases. However, there is evidence to the contrary, including the Downs (2002) finding of some association in some years before 2000.

Burchell *et al.* (2002) predicted that from 2000 to 2025 house prices in markets with smart growth would experience house price declines relative to markets without smart growth. However, even after the bursting of the housing

bubble, median house prices in the prescriptive markets have raised \$68,000 relative to prices in responsive markets (Cox 2011b).

It can be concluded that there is little agreement on the magnitude of the effect of growth controls on home prices, an increase is always the result.

Economist Downs (1994) of the Brookings Institution has indicated the importance of maintaining the principle of competitive land supply. He notes: "If a locality limits to certain sites the land that can be developed within a given period, it confers a preferred market position on those sites. In economists' terminology, any such limitation shifts the demand curve for developable land upward and to the left, raising land prices. If the limitation is stringent enough, it may also confirm monopolistic powers on the owners of those sites, permitting them to raising land prices substantially". This is illustrated by the experience of Portland, Las Vegas and Phoenix (Cox 2011a).

Grimes (2007) found that land prices across Auckland, New Zealand's urban growth boundary varied significantly. Land prices per acre just inside the urban growth boundary averaged 10 times the prices per acre of comparable land just outside the urban growth boundary.

A variety of value differentials between land on which development is permitted or not permitted has been identified in the United Kingdom. Cheshire (2010) has found cases in which agricultural land could increase in value 700 times when rezoned for residential development in Southeast England. Leunig (2007) of the London School of Economics founded differentials of 500 times in the London area. The Barker report contains data indicating that differentials average 250 times outside the London area.

The research also indicates that prescriptive land use regulation is associated with intensified housing bubbles. As noted above, Glaeser and Gyourko showed that in the house price booms of the 1980s and 1990s "price increases were much higher in markets that were more supply constrained".

Sowell (2007) of the Hoover Institution associated smart growth regulation with the extraordinary run-up in prices in some markets and noted that where smart growth had been resisted, "home prices remained reasonable despite rising incomes and population". He commented on further in the housing boom and bust: "It is very doubtful if many in academic communities who have campaigned zealously for land use restrictions under any of the heady and lofty labels used for these restrictions, have any idea that they are in any way responsible for the dire financial conditions in the country today or for the hundreds of thousands of workers who have lost their jobs".

Later research by this author indicates that when more the profligate mortgage loan policies were implemented during the US housing bubble, metropolitan areas that had adopted prescriptive land use policies lacked the resilient land markets that would have allowed the greater demand to be accommodated

without inordinate increases in house prices. These resulting price increases were unprecedented and led to the intensive mortgage losses than precipitated the international financial crisis (Demographia 2015).

Finally, a review of international housing markets cited above by OECD (2011) noted that poorly managed housing markets played a key role in triggering the recent global financial crisis and may be slowing the recovery.

2.5. Land Use Regulations for Crisis Management

As it was earlier discussed, state regulation of land-property markets in the form of statutory development control is not essential to enable their effective performance. Those who propose abolishing public planning prove this through numerous examples. But even the most libertarian advocates of unregulated land development do not deny the need for a basic sovereign regulatory framework without which markets cannot exist. For land-property markets this framework is the legal system and its institutions: the judiciary and courts, which confirms property rights and enforces contractual obligations. Often regulatory planning in the form of statutory development control supplements predictive and indicative planning. This may take the form of local government administered zoning plans and codes (as in the USA) or more elaborate and developed national statutory planning and development control systems, as in Europe and the UK (Alexander 2014).

Transaction cost theory explains this as third-party governance modifying and providing administrative support to facilitate the performance of the land-property market (Alexander 2001). Regulatory planning can also be an important reinforcement of predictive-indicative planning, as it represents public agency commitment to making the plans' projections of future land use distribution and activity intensity and location self-fulfilling prophecies. This can be a significant contribution to market actors' confidence in the quality and authoritativeness of plans' information.

2.5.1. Land-Property Markets: Planning and Development Control

Planning is one form of market support for future development and property market transactions; it can involve public-governmental and private agents in various combinations. Public planning (without statutory regulation) can take the form of minimal indicative planning showing proposed capital investments in public infrastructure and facilities, providing important information that reduces market uncertainties. Planning is also undertaken for substantial areas of land under single control or ownership. Such large-scale and long-range land-use planning becomes one of the developmental tasks of the landowner-developer,

who can be a public or private sector entity. Examples of such public planning include federal land-use planning of national parks and special function communities and installations in the U.S., planned new towns on public land in Israel, and “contract zoning” of crown lands in Hong Kong (Alexander 2014).

Government may acquire land by expropriation or purchase and dispose of it as prepared land, developed sites or improved property just like a private developer. New towns and planned communities programs in the UK and other countries, Swedish public “land banking” and development, and municipal land acquisition and development in the Netherlands are some cases.

Public-private partnerships have planned and developed many significant large-scale projects. These include US downtown development in the 1970s and ‘80s, British urban revitalization projects realized by Urban Redevelopment Corporations under the Thatcher government, and also public programs to facilitate large-scale land assembly for subsequent planning and development by private developers, such as the US Community Development program in the early 1970s and the Israel Land Administration’s current disposition program of public land (Alexander 2014).

Finally, much large-scale long-range land use planning is done by private firms: development corporations owning tracts of land large enough to ensure their control over their relevant environment. This is the private sector counterpart to the public sector indicative planning discussed above, where corporate planning and investment in land preparation, infrastructure and amenities take the place of government. Such planning and development has produced company towns, planned communities, retirement communities and gated estates, and developer-planned urban and suburban neighbourhoods. In this form of bilateral governance, private agents also takeover government’s role in development control (Alexander 2014).

When the planner-developer is a private firm or corporation, development control is exercised through contractual covenants and restrictions (CCRs) that are an integral part of every parcel’s deed of sale. CCRs assure buyers of sites and properties and residents of the planned community that neighbourhood effects over time are predictable and constrained to narrow discretionary limits, and that the developer’s plans for the area will be implemented. In this way CCRs create and maintain property values just as zoning does (Alexander 2014).

Statutory planning systems are linked to regulative control of development: zoning, growth controls, building regulations and regulation in other areas affecting land development. These include environmental regulations (e.g. air pollution ceilings limiting industrial development), hazard mitigation (e.g. floodplain development constraints) and special area designations such as coastal management areas and historical zone designations. On the face of it a rigorous statutory planning and development control system should minimize the hazards

of uncertainty in land-property markets. But flaws in regulatory development control make it fall short of this ideal. One limit to its efficacy is that it can prohibit change, but cannot make desired development happen; its success depends on the effectiveness of its implied and enacted sanctions and the efficiency of enforcement (Siegan 2009).

An extensive research literature (too large to cite) analyses the shortcomings (or advantages) of regulative planning and zoning (see e.g. Siegan 2009; Ihlanfeldt 2009). Another flaw is the inherent tension between rigidity and flexibility in the planning and regulatory system. In theory, a rigid system that mandates strict conformance to detailed plan requirements maximizes market certainty and confidence. But in practice it is often bypassed in unforeseen situations or when authorities' and other involved parties' interests prescribe a nonconforming decision. A more flexible system enables constructive adaptation of decisions to new unforeseen situations and changing contexts. But flexibility contributes to market uncertainty, and is easily abused by self-interested authorities collaborating with particular interests (Alexander 2014).

Land-property markets are not "free" markets that work as pre-scribed by classic economics or the "spontaneous order" extolled by Hayekian libertarians. The above analysis shows conclusively that land-property markets do not share some of the critical prerequisite-sites that markets need to work properly. The most basic attribute of land – location – severely limits its substitutability as a marketable good; land, qualified by location, is a limited resource (sometimes irreplaceable) in a way that market goods are not; these two attributes make land and property investment assets, valued for their potential to increase wealth with rising prices, rather than their use value (as are normal market goods) that increases as price falls. But unlike other tangible investment assets speculation in land-property markets can have severe social and economic consequences that demand public intervention. Like the financial markets Buttonwood (2010) analysed in *The Economist*, land-property markets are a special case. To work, land-property markets must take on modified forms of governance. In bilateral governance providing market support, predictive or indicative planning supplies essential information to market actors. Here planning is done by public actors (government and public agencies) as landowners, public-private partnerships, and by private developers who implement their plans through CCRs that prescribe development. In third-party governance regulatory planning and development control gives administrative support to facilitate operation of the land-property market and intervene in the public interest when necessary. These findings suggest that the nostalgia of some political economists and policy makers and even some planning theorists (Moroni 2010; Holcombe 2013) for the "spontaneous order" of urban development through land-property markets unconstrained by any deliberate forward planning is misplaced. "Free" land-property markets are

impossible, even (as shown here) as theoretical assumption (Alexander 2014).

On a more practical plane, policies to reform land-property markets by freeing them from planning constraints may be misadvised. This is what motivates most reforms of regulatory planning frame-works. In the performance-based management reforms instituted in the UK and the USA in the 1990s (Carmona, Sieh 2005; Baker *et al.* 2006) their neo-liberal aspirations were only implicit. But promoters of new planning legislation in New Zealand (Gleeson, Memon 1994) and Israel (Han 2010; Meir-Brodnitz, Alexander 2011) openly proclaimed their aim to free land-property markets (Alexander 2014).

Government intervention in the land market can have profound impacts on real estate market outcomes. On the supply side, government intervention in the land market can lead to a decline in the amount of land available for housing development, which in turn will put downward pressure on new housing supply (Yan *et al.* 2014).

Government intervention in land market exists in countries with different land use systems. The intervention generally takes two forms. The first involves various types of land use regulation (such as zoning, urban growth boundaries, greenbelt, etc.) that imposes control over the uses to which a piece of land can be put. The second involves direct government control over land supply (government acting as a market participant and directly supplying land to land users). Government intervention in land market can have profound impacts on real estate market outcomes. On the demand side, because government intervention in land market can help preserve environmental amenities, enhance accessibilities and promote more efficient provision of public service and infrastructure, it can increase the demand for housing through an amenity effect (Dawkins, Nelson 2002; Cheshire, Sheppard 2004, 2005; Ihlanfeldt 2007). On the supply side, government intervention in land market can lead to a decline in the amount of land available for housing development, which in turn will put downward pressure on new housing supply (Cheshire, Sheppard 2004, 2005; Dawkins, Nelson 2002; Ihlanfeldt 2007; Saiz 2010; Vermeulen, van Ommeren 2009).

Because governments around the world are faced with the task of ensuring an adequate supply of housing to meet demand improving housing affordability and maintaining stability in the property market (Chiu 2007; Kim, Cho 2010; Ooi *et al.* 2011), examining the impacts that government intervention in land market has on real estate market outcomes is an area that deserves research attention.

Although the impact that government intervention in land market has on new housing supply has been the focus of a growing number of studies (Quigley, Raphael 2005; Saiz 2010), most of these studies are conducted in developed countries and scant attention has been devoted to emerging market economies

which are undergoing both rapid economic growth and significant institutional change.

2.5.2. Some Countries' Experience on Land Use Regulation

China's real estate market provides a good opportunity to examine the impacts that government intervention in land market has on land supply and new housing supply in fast-growing developing countries (Yan *et al.* 2014). The market-oriented urban housing sector was established in China in 1998. In the post-1998 period, major institutional changes in urban residential land market occurred in 2004. The government has acquired complete control over urban residential land supply and imposed more stringent regulatory constraints on rural-urban land conversion since 2004. There was a decline in residential land supply in many major cities after the Chinese government strengthened the intervention in land market, and it is expected that the decline in land supply has put downward pressure on housing supply.

Yan *et al.* (2014) investigates the process leading to stronger government intervention in the land market in China and examines the impacts that government intervention in the land market has on residential land supply and new housing supply in 16 major Chinese cities. It is found that there was a decline in residential land supply after the Chinese government strengthened the intervention in the land market. The rates of the decline in land supply varied across cities. It was highest in the largest cities, and lowest in some medium-sized cities with a relatively large amount of agricultural land. By estimating the models of new housing supply, it is found that land supply is positively related to new housing supply, and thus the decline in land supply after the Chinese government strengthened the intervention in land market has put downward pressure on new housing supply. It is also found that there was a significant decline in housing supply elasticity after the Chinese government strengthened the intervention in the land market (Yan *et al.* 2014).

Studies that link economic cycles with other, specifically geographical cycles – such as those related to territory and cities – are increasingly common (Pérez 2010). The connections between cities and the economy have long been examined and are the focus of well-known urban studies that range from the classic works to more recent ones (Antrop 2004; Yeong-Hyub, Short 2008). In general, urban geography examines the economic activities that have driven urban growth or decline throughout history – the fundamentally important links between urbanization and industrialization. These relationships are more complex in the post-industrial era and the urbanization process has come to depend on a variety of interconnected variables (e.g., globalization, informationalisation, the planetary ecological crisis) (Pérez 2010; Yan *et al.* 2014).

More recent are studies that analyse the impacts of economic cycles on territories and cities, such as works on landscapes (Antrop 2004) and fundamentally, changing land uses. The scientific output on the latter topic in recent years has grown substantially hand-in-hand with the new techniques and progress in developing geographic databases on the subject. For instance, experience of Spain is further analysed in more detail.

There have been three major housing bubbles in Spain's history during the past half century: 1969–1974, 1986–1992 and 1998–2006. Although with specific features, the three appeared within political and economic settings favourable to housing construction as a speculative investment: the Spanish developmentalism of the 1960s; the entry into the European Economic Community in 1986, the Economic and Monetary Union and the adoption of the euro as the common currency in 1999. And all three bubbles had the same consequences: housing oversupply, a pronounced foreign deficit, soaring housing prices, and their subsequent fall. The territory is one of the big losers of excess construction, but so is society itself. A series of urban planning laws ensured housing construction at paces well above population growth. However, although it may seem contradictory, this did not resolve the population's access to housing (Pérez 2010).

The Land Law of 2007 introduced certain major measures intended to combat excess urbanization and urban planning speculation, and to control land and housing prices, among others. Nevertheless, as has been true so often during Spain's recent history, these goals clash with economic policies, especially in times of crisis, such as the present. This has led contradictions to emerge: the construction sector is blamed for the current economic crisis and territorial destruction while mechanisms are generated for its revitalization. In short, it seems that the economy continues to run other policies. Territorial, urban planning and environmental policies function as correctors of economic strategies (Pérez 2010).

Since the start of the economic crisis in Spain, the government has defended the need to change the production model and argues that residential construction cannot continue to lead the Spanish economy. The so-called "Plan E" (Spanish Plan to Stimulate the Economy and Employment), funded by the public deficit, was passed in early 2009 to address the general situation. It has four strands: measures to support businesses and families; measures to promote employment; financial and budgetary measures; and measures to modernize the economy. Chief among these are measures intended to generate employment in municipal public works. The amount of investment is considerable – EUR 11,000 million – as is the number of jobs directly derived – approximately 300,000. This has been assessed as the government's main economic measure for combating the crisis and unemployment. Without going into a detailed evaluation and regardless of the electoral intentions that can be divined in many cases, the measure provides substantial support for construction firms in serious crisis after residential

construction's collapse. However, the central government says that structural changes come from the hand of the Sustainable Economy Law, which makes rehabilitation and rental policies the key to overcoming the economic crisis. Since its earliest considerations, this law has been criticized by ecologist organizations and the political parties of the opposition. Disperse objectives and few concrete ones, contradictory and hardly sustainable measures are some of the assessments that have been levelled against it. For example, to stimulate economic growth, the law is firmly committed to promoting elements as unsustainable as the construction of infrastructures and the globalization of the Spanish economy. And once again there are contradictions: the executive recognizes the role of the real estate sector in Spain's negative economic situation, yet again relies on "bricks" as a key activity for the future. However, now there is one difference: the existing city could be the main beneficiary (Pérez 2010).

On the one hand, this law drives the rental system, yet fundamentally reduces the tax benefits involved in ownership. The Sociedad Pública de Alquiler (Public Rental Corporation) was constituted in order to encourage rentals in May 2005. In Spain, this type of occupancy represented a mere 13.18% of the market in 2008. The Sustainable Economy Law improves deductions for renting a first home and matches them with the deduction for purchasing homes. Linked to this, the tax deduction for purchasing homes was limited, thus eliminating the related tax incentives that in part, led to the boom a few years ago. In addition, when a first home is purchased after a deduction was taken for the purchase of other, earlier first houses, no deduction can be taken for purchasing or rehabilitating the new home, whenever the amounts invested therein do not exceed the investment in earlier homes, to the extent that they would have been deducted (Pérez 2010).

Moreover, in the realm of rehabilitation, the Ministry of Housing has launched an extraordinary program: the Plan Renove de Rehabilitación de Viviendas (Housing Rehabilitation Plan), a new indication of changing trends, despite its negligible budget of 110 million euros. In this case, priority is given to works that have plans to start as soon as possible and create the most jobs. However, the definitive stimulus for rehabilitation should come from the Sustainable Economy Law, an entire chapter of which is dedicated to rehabilitation and housing. Prominent is the authority granted to the Administration to regulate improvement works in cases in which a building is affected by a rehabilitation program and the reduced taxes on rehabilitation activities, through both deductions as well as a reduced VAT of 7% (Pérez 2010).

In summary, urban policies during the years of crisis have oscillated between sharp criticism of the real estate and construction sectors' behaviour and the notion of recovering sectors that create many jobs and, which generate a good deal of economic activity.

2.6. Case Study: Towards Integrated Approach of Planning and Management of Land Resources in Lithuania

2.6.1. Real Property Administration System in Lithuania

When analysing principles and content of the real property administration system, it is necessary, first of all, to accurately identify an object. In order to standardise a concept of real property administration system, one should clearly define what a *real property object* is, and what constitutes a *real property administration system* (Kasperavičius 2015a).

A general concept of real property objects is based on the provisions of the Civil Code of the Republic of Lithuania (2000) and the Law on Real Property Cadastre (2000, 2001, 2003). The Civil Code (2000) defines that *real property objects are parcel of land and things related thereto, which cannot be moved from one place to another without altering their essence and without significantly reducing their value (buildings, equipment, plantations and other things, which in accordance with their purpose and nature, are immovable)*. Ships and aircraft provided for in laws are also treated as real property objects and are subject to compulsory registration. The law may recognise also other property as immovable thing. Thus, real property objects are things immovable by nature and things movable by nature but considered immovable by law.

Appurtenances of real property objects are considered to be independent auxiliary things which belong to the principle thing and which by their nature exist only in conjunction with the principal thing. Merging two or more things doesn't make any of these things the appurtenance of real property object unless there are features showing belonging to real property object.

It can be stated that effective real property administration is (Kasperavičius 2015a):

- 1) a possibility to establish a common property stock;
- 2) a possibility to determine human and nature resources and procedures for their disposal;
- 3) a guarantee for property use and possession rights;
- 4) a basis for the implementation of tax policy;
- 5) a background for the development of economy in the country and planning of the services provided;
- 6) a possibility to mobilise capital securing mortgages.

In the traditional structure of society, the benefits of a modern real property administration system may not be immediately obvious. With expansion of the state, the need to raise capital is increasing; therefore an opportunity to use real property as collateral for a loan becomes important. The efficient real property registration system in place provides guarantees also to the persons outside the state (Kasperavičius 2015a).

Graphical information is a prerequisite for the effective real property administration. The system must also include geographic information: data on location, size, layout, area, use, productivity and value of property units. Using graphical information, a tool is created which enables to assess the extent of real property and options for its disposal.

Qualitative data stored in the system and suitable technologies ensure reliability and confidence in the real property administration system, encourage investors to trust the system, enhance investment and thus contribute to the country's overall economic growth. In summary, it can be said that a modern real property administration system is a methodically arranged public system for the collection, processing, recording and reporting of data on real property to the stakeholders that combines all the data as defined in the legislation on real property, ownership and possession rights to it, restrictions and limitations of these rights, as well as graphical data, set by surveying their boundaries or contours (Kasperavičius 2015a).

Talking of the experience in developing the real property administration system in Lithuania, one has to bear in mind that when Lithuania started radical economic reforms in transition to the market economy it has faced a new very important task, i.e. restitution of real property and privatisation. A new real property administration system had to be created; legislation regulating fundamental property relations and legal registration of the restituted property and rights thereto ensuring the security of real property management had to be enacted. New legal and institutional infrastructure and the business environment opened new opportunities for Lithuania and had a great impact on the national economy and public life (Kasperavičius 2015a).

In the period before the membership of the EU and after it, Lithuania has achieved considerable successes in restoring citizens' rights to land ownership. Until the beginning of 2009, 4 millions of hectares or 97.5% of the area applied for has been restituted to former owners or their relatives (where the right to land ownership and/or relation to former owners has been proven by documents) in the Lithuanian countryside. In the urban areas (according to the state of June 1, 1995), decisions for restitution has been adopted for 63.9% of the total land applied for (EC 2015).

In Lithuania, the processes of land restitution and privatisation of collective farms were closely linked to each other. The legislation allowed the acquisition of agricultural assets that belonged to collective farms (animals, machinery) only to the persons that, by virtue of the process of restitution, had regained ownership of a certain amount of agricultural land. This can be called as best practice example (EC 2015).

Lithuania has established an integrated multi-purpose real property cadastre and register system containing the cadastre and register data in one central

database. The system has been developed in line with the ECE recommendations on land administration, taking into account the advice and recommendations from international experts and the experience gained by Western countries and adapted to Lithuania's economic situation and traditions.

The development of the real property cadastre and register system started in 1992, when the digital registration of land began. In 1997, the State Enterprise Centre of Registers was established and tasked with integrating all real property records and cadastral data into one organization and taking over the maintenance of the real property cadastral map. Data from the Real Property Register as well as data on land, buildings, constructions, offices and apartments were integrated into a single real property information system. Since then legal, technical and geographical records have been managed in a single system under a single organization, which is an advanced approach. The system secures the registered rights to real property, supports the lawful conveyance of real property and serves fiscal purposes, i.e. land taxation. It is also an instrument for national real property policy and a tool to help the real property and credit markets develop in the country (Sabaliauskas, Kasperavičius 2015).

Lithuania's integrated Real Property Cadastre and Register distinguishes the following main segments (Sabaliauskas, Kasperavičius 2015):

- 1) Descriptive data, i.e. description of a property, its location and main qualitative and quantitative characteristics, type of use, its value and price;
- 2) Legal data, i.e. records the owner, possessor or manager of a property and specifies the type of possession (ownership, lease, trust or other right), also indicates the encumbrances on the right of possession and other relevant data;
- 3) Legal facts;
- 4) Graphical description, i.e. cadastral map.

The State Enterprise Centre of Registers is responsible for the registration of real property and related rights and runs the Real Property Cadastre and Register. It is forecasted that after completion of the real property restitution process and privatisation of the state-owned land, totally about 2.5 million land parcels (real property units) will be formed in Lithuania; whereas the number of buildings, apartments and other structures can reach 4.5 million units. Total number of real property units could reach 8 million (currently, about 6 million real property units have been already registered) (Kasperavičius 2015a).

Archiving is an important part of the Real Property Cadastre and Register system. The archives include documents on real property registration, documents on the real property cadastre, cadastral maps, documents on real property valuation and market research, organizational, regulatory and informational documents. Each year, the archives grow by 7%. Their volume and importance made it necessary to rearrange the archives and start an electronic archive

(Sabaliauskas, Kasperavičius 2015). Fully computerized e-documents archiving system was implemented in 2006. Currently, more than 18.1 million units of scanned document copies submitted for registration are stored in the archive; annually the electronic archive increases by more than 2 million scanned documents: approximately by 2 million documents of the Real Property Register, by 472,000 documents of the Register of Legal Entities and by 12,000 documents of the Address Register (Kasperavičius 2015a).

After the re-establishment of independence, Lithuania adopted all basic laws necessary to establish a framework of real property administration that would create favourable conditions for the economy, market and business development, and made significant efforts to harmonize national laws with EU legislation before accession (Sabaliauskas, Kasperavičius 2015; Kasperavičius 2015a).

The Constitution (1992) lays down the basic principles for the organization of institutions and their interrelationship. It ensures basic freedoms and rights, among them legal protection for the rights of ownership of property. The Constitution specifies to whom the rights of ownership may apply. The right of exclusive ownership of certain objects and facilities of national significance is reserved to Lithuania.

All civil legal relations, including those relating to real property, are governed by the new Civil Code (2000), which came into force on 1 July 2001. The Civil Code introduces real rights, specifically: rights of possession, ownership, trust, servitude, usufruct, development, long-term lease, mortgage, pledge and administration of another person's property. It establishes that ownership of a land parcel can include buildings and other constructions on it. The new Civil Code repealed the compulsory registration of real property and rights, but unregistered transactions may not be enforced against third parties. In the event of competing claims to real rights in the same property, it is the first person to register the transaction who is considered to be vested with the rights in question.

The Law on Land, adopted in 1994, is the primary general law on the regulation of ownership, management and use of land and it has recently been amended to avoid duplication with provisions in the Civil Code and other laws. The Law on Land Reform (1991, 1997) and the Law on the Procedure and Conditions for the Restitution of Citizens' Rights to Real Property (1997) established a framework for land reform and the restoration to Lithuanian citizens of rights of ownership to land and aimed at introducing a new system of land management and ownership based on free-market principles. The Law on Land Reform (1991, 1997) governs the implementation of land reform. It includes general provisions on the restitution of land, criteria for entitlement to private landownership and the procedure for the privatization of land. The Law on the Procedure and Conditions for the Restitution of Citizens' Rights to Real Property (1997) sets out the conditions applicable to the restitution process; it specifies

the types of land that are subject to purchase by the state rather than restitution to former owners, such as roads, land intended for state defence, state forests and national water bodies, and outlines the procedure for applying for restitution and recourse to the courts.

The Law on State Registers (2004) stipulates the procedure for establishing, maintaining, using and abolishing public registers, lays down the rights and obligations of the institutions responsible for maintaining them, and the rights and obligations of their users. Laws specific to each register specify the objects to be registered, the composition of each register, and provisions for the maintenance and supply of data on, for example, legal entities, individuals and real property.

The Law on the Real Property Register (2001) governs the registration of land, buildings, other immovable, rights thereto and legal facts. It regulates the status of the Real Property Register, its establishment and management, and the provision of data and information. It stipulates that the Real Property Register is public; it guarantees the protection of registered rights and property, and the accuracy of the data in the register; and it makes provision for correcting the register and paying of compensation in the event of loss, subject to certain exceptions.

The Law on the Real Property Cadastre (2003) regulates the maintenance of the cadastre of land parcels, buildings and other real property, the procedure for recording real property data in its databases, and defines its legal status.

The Law on Cartography and Geodesy (2001, 2010) regulates the management of geodetic, topographic and cartographic activities, the principles of creating databases of geographic information systems and their integrity, geodetic control and ownership of cartographic material, the main rights and duties of the State and municipal institutions and enterprises involved in map production, geodetic surveying, gathering of data, record-keeping and use in geodesy and cartography.

The Law on the Notariate (1992, 2012) governs the function and performance of the notary, as well as the regulation of the profession. Duly appointed notaries are authorized to act on behalf of the State in establishing the undisputed subjective rights and legal facts of natural and legal persons, and to ensure the protection of their legal interests and those of the state.

The Law on Electronic Signature (2000) was amended in 2002 and 2013 to comply fully with the EU Directive on Electronic Signature. The Law recognises and gives legal validity to electronic (digital) signatures; defines requirements for the creation, verification and validity of electronic (digital) signatures; defines the rights and obligations of users of digital signatures; regulates digital signature certification services and defines legal requirements for providers of such services; defines the main functions and rights of an electronic signature regulation authority.

A number of tax laws are in force. The Law on Tax Administration (2004, 2014) governs the submission of information about economic activities to the National Tax Inspectorate. The Law on the Tax on the Immovable Property of Enterprises and Organizations (1994, 2004) is self-explanatory. The Law on Land Tax (1992, 2011) specifies the tax rate imposed on landowners. The Law on Property and Business Valuation (2011) lays down valuation principles and methods, as well as values rights, obligations and responsibilities. The Law on Inheritance Tax (2002) regulates the tax regime applicable to inherited property, depending on the residential status of the taxpayer.

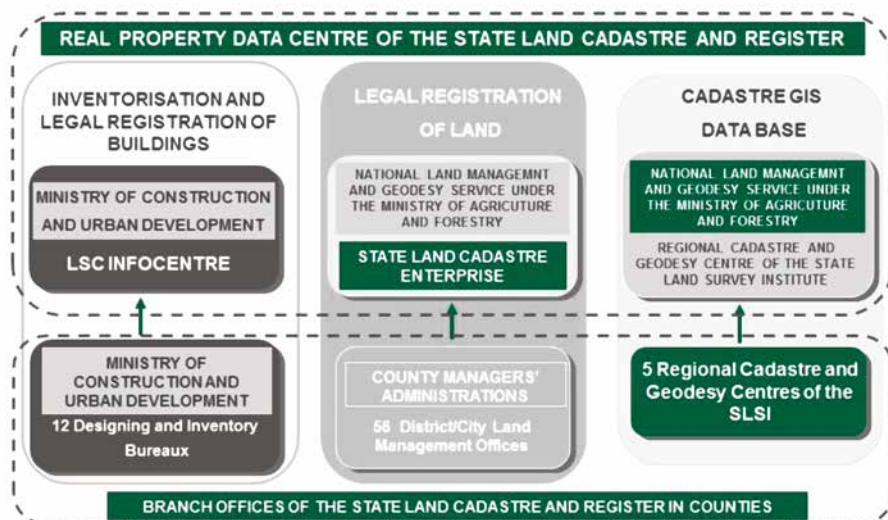


Fig. 2.8. Administration of real property cadastre and register in 1991–1997 (Kasperavičius 2015a)

During the period of 1991–1997, the real property administration system had been functioning partly as a fragmented institutional infrastructure created in the Soviet time, where land administration was completely separated from the management of buildings and other structures; separate data processing centres were functioning and each institution took its own decisions (Kasperavičius 2015a) (see Fig. 2.8).

In taking decisions regarding the restitution of ownership rights to real property and performing other land reform works, there was a need to formulate a general concept of real property cadastre and register, to create a centralised centre for real property data collection and processing. For this purpose, in 1997, the Government of the Republic of Lithuania founded the State Land Cadastre and Register Enterprise.

Important economic reforms, restitution of ownership rights, privatisation and the on-going development of a modern real property administration system have completely changed the institutional framework of the real property administration. Today, the following institutions carry out basic real property administration (Sabaliauskas, Kasperavičius 2015; Kasperavičius 2015a, b) (see Fig. 2.9).

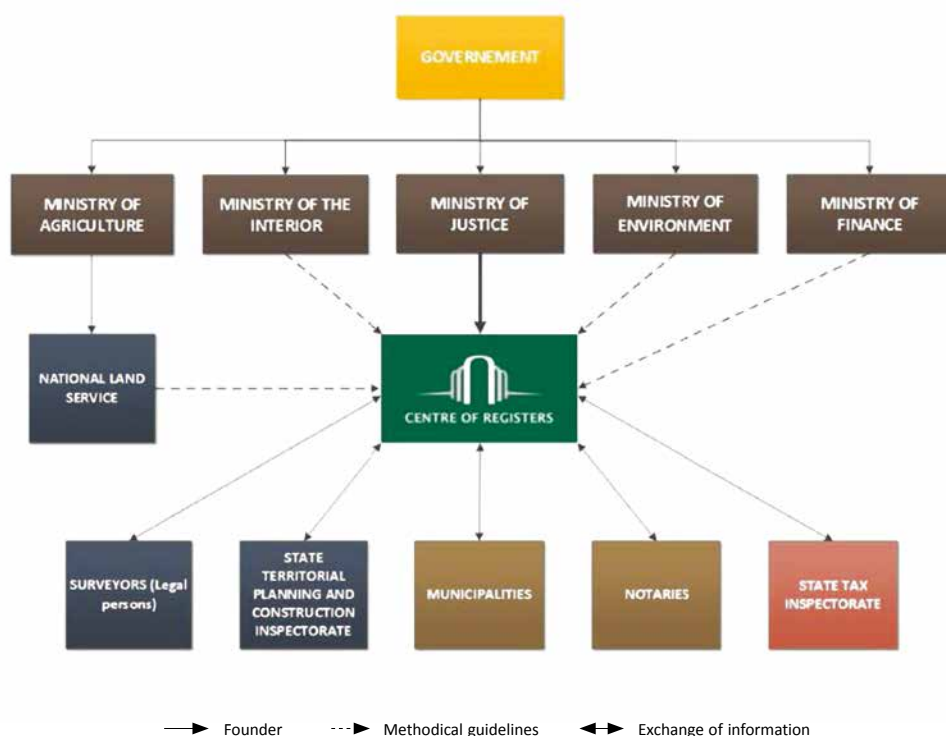


Fig. 2.9. Public organisational structure of real property administration system (Kasperavičius 2015b)

The Ministry of Agriculture exercises state administration functions related to land, food, fishery and rural development, and implements state policy in these fields. Its National Land Service pursues State policy in land management and administration as well as land reform, land cadastre, geodesy and cartography. The following organizations and agencies are also involved in geodetic and mapping activities: the Department of Geodesy (Vilnius Gediminas Technical University) develops methodologies for the geodetic networks; the National Centre of Remote Sensing and Geoinformatics “GIS- Centras” performs the small and medium-scale base mapping; the State Enterprise Centre of Registers creates and maintains the cadastral maps; the Institute of Aerial Geodesy is responsible for topographic mapping in Lithuania; private land survey offices together

with the temporary land restitution organizations are engaged in mapping of land parcels and demarcation of parcels. Cadastral surveying of land and buildings is carried out by the public sector and the private sector represented by surveying companies operating only through licenses issued by the National Land Service. They undertake various surveying activities: cadastral surveying of land, inventory of constructions, development of detailed plans, topographic and engineering photos, consultations on real property issues, etc.

The Ministry of Environment is responsible for territorial planning, preparing and adopting relevant regulations, norms and standards as well as preparing policy documents since 1998. The Ministry formulates national policies for environmental protection, forestry, use of natural resources, geology and hydrometeorology, territorial planning, construction, provision of housing, and utilities, and coordinates their implementation. Its State Territorial Planning and Construction Inspectorate, exercises State supervision and control over territorial planning and construction. It is responsible for drafting documents related to the State's supervision and enforcement of their provisions.

The Ministry of Justice drafts laws and governmental resolutions, organizes the implementation of legal reform, oversees institutions such as the State Enterprise Centre of Registers and the Central Mortgage Office, and supervises the activities of notaries.

The Central Mortgage Office administers the Mortgage Register, the Register of Property Seizure Acts, the Register of Marriage Settlements, the Register of Leasing and Sale and Purchase by Instalments Contracts and the Register of Wills, and also provides information from those registers. Hypothec registers of the local courts register of mortgages and property seizure acts.

Lithuania has a private notary system. Notaries attest transactions and mortgages, issue inheritance certificates, authenticate copies and extracts from documents, certify signatures on deeds, and draw documents up or certify the authenticity of information transferred to the register of legal persons.

The State Enterprise Centre of Registers is engaged in: the administration of the Real Property Cadastre and Register, Register of legal entities, Address register, and of the appraisal of real property, cadastral surveying, providing official information stored in the registers, and updating the cadastral map.

The Ministry of the Interior is in charge of public security, guarding State borders, civil defence, and control of migration, public administration and government reform, development of local self-governance and regional development. The Ministry is responsible for the Population Register.

The Ministry of Finance drafts the State budget and the municipal budgets; it is in charge of State investments, taxes, duties, national coordination of EU financial support, tax and tax administration policy, etc. Its State Tax Inspectorate is the central tax administrator. It estimates tax payments and other

contributions to the State (municipal) budget, recovers unpaid taxes, imposes fines on taxpayers pursuant to tax laws, etc.

The county governors, who head the county Administrations, implement State policy on regional development, social security, education, culture, health care, territorial planning, land use, environmental protection and other areas. They are responsible for State and interregional programme in their counties, for land reform, and for the privatization and sale of State-owned land.

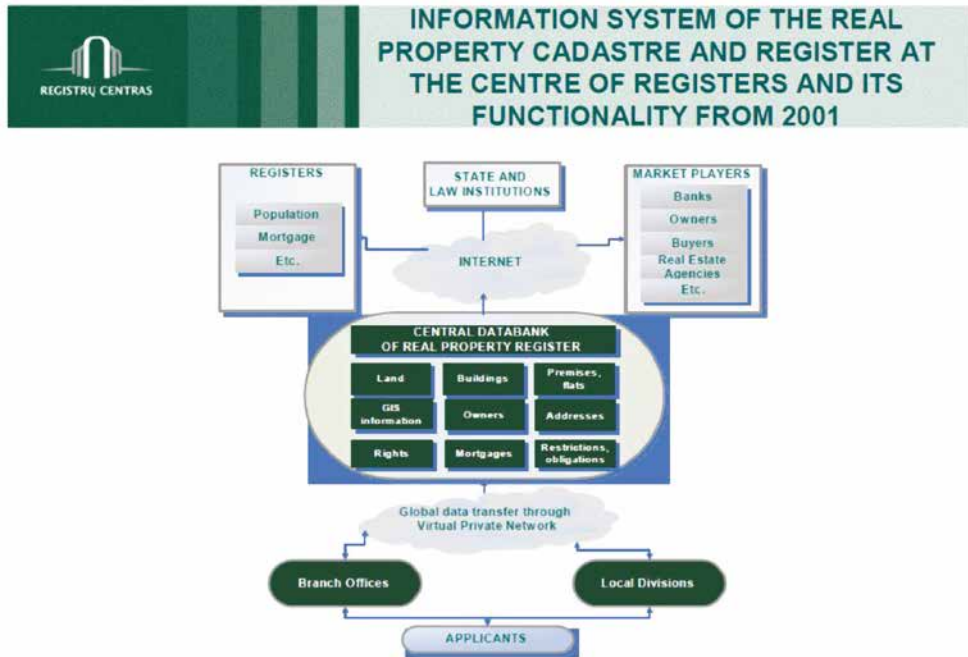


Fig. 2.10. Information system of the real property cadastre and register at the Centre of Registers

The self-governing municipalities are responsible for issuing construction permits, territorial planning, setting addresses and making any changes to them.

When private ownership was introduced there was a need to secure rights to land and other real property and cadastral surveying started to be made and cadastral maps were used which were prepared by using the best available maps in scale 1:10 000 and larger scale maps. The main task was the creation of unified register for rights in land and other real property. That is why both owners and bankers trust more real property registration system and the investments can be stimulated. Primary registration of land and other real property made a great progress in Lithuania and now is going to the end. In order to support Real Property registration and management there is a system created which operates

in 10 SECR Branch Offices and 40 Districts Client Service Divisions (Fig. 2.10).

Every moment new records in the local offices are sending to the Central data bank threw On-line system. The legal register contains main data about owner, characteristics of land parcels, and restrictions on land use, easements, servitude's, buildings, pledging and mortgage (Sabaliauskas, Kasperavičius 2015).

2.6.2. Land Cadastre in Lithuania

Proper registration of plots of land ensures safety of ownership, the appropriate management of both space and land and efficient tax calculation. The trends in changes and development of the real cadastre arise not only from new legal, economic and administrative regulations, but also from society's need for access to spatial information to solve the emerging problems of globalisation, sustainable development, crisis management and environmental protection (Konieczna, Trystuła 2014).

In Lithuania land holdings acquired by new owners are registered in the Real Estate Cadastre. On registering, the limits of a holding are put on digital maps what allows to check whether the limits of the new holding do not intersect with the limits of neighbouring holdings which are already shown in the maps of the Real Estate Cadastre or with boundaries of administrative units, cadastre areas and blocks or with adjacent roads, water bodies or waterways. For putting the limits of a holding on digital maps the use is made of newest cartographic materials, orthophotographic maps and georeferential data of the Lithuanian territory (EC 2015).

However, because since 1992 holdings created during land reform were at first registered in the Registry of Real Estate and only later put on cadastre maps, there is considerable number of holding limit discrepancies. Therefore in 2005 a process of rectification and updating of cadastre maps was started, with the aim of rectifying those borders of holding which clash with natural limits of terrain such as roads or waterways. For every holding, the limits of those adjacent holdings which were put on cadastre maps later were checked on the basis of update cartographic materials (ortophotographic maps, georeferential data) (EC 2015).

Efficient administration of land holding needs reliable geographic data. The creation of Lithuanian georeferential data (ortographic and topographic maps, georeferential vector databases etc.) started before the EU membership. In 2004 an opinion poll was conducted among users and producers of geographic data which allowed discerning priority areas for geographic data production, important for both producers of electronic products and services and for general population. Such priority areas are administrative borders, hydrography, transport, forests, ortophotographic images, and borders of real property entities entered in cadastre, addresses, relief of terrain, geodetical base and geographical names.

Current geographic data are improved by making more efficient their management, guaranteeing interactivity and interface, simplifying access for users, improving data quality and promoting among users and larger public (EC 2015).

Real property formation is a set of rules, measures and actions based on legislation enabling to document or establish real property as an object of real right (in rem) (the Law on Real Property Cadastre of the Republic of Lithuania 2000).

Legislation prescribes for a legal mechanism for real property formation which consists of the object creation chronology, information about the performers, responsibility and documentation. Real property formation performers and responsible persons are appointed. All these institutions and persons follow the established rules; implement measures and actions prescribed by legal acts. The execution initiative as well as the responsibility is apportioned between the government structures and the private sector (Kasperavičius 2015a).

The Lithuanian cadastre system is based on the surveyed land parcel. The system records graphic and attribute data related to real property objects. The main measured and recorded real property cadastre and register unit is real property, i.e. land parcels, buildings, apartments, premises, engineering structures. Only the surveyed land parcel can be recorded in the real property cadastre and register, and only the registered property can be transferred (Kasperavičius 2015a).

Cadastral surveys of land and buildings are performed by public and private sector represented by specialised companies whose employees have surveyor qualification certificates. The National Land Service issues surveyor certificates to perform these surveys. The survey data and other cadastral information are recorded in the Real Property Cadastre subject to the real property location. Each property object has a unique number that does not change during the life cycle of the object.

The strategy of real property cadastral surveys is defined by the Law on the Real Property Cadastre adopted in 2001 by the Seimas of the Republic of Lithuania. According to the Law on Land (2004) and the Law on the Land Reform (1991, 1997) individual persons or legal entities who have obtained qualification certificates in the manner prescribed by the Government to carry out survey of real property objects have the right to prepare land management plans and perform cadastral surveys of land parcels (Kasperavičius 2015a).

Supervision and control of real property cadastral surveys is executed by two institutions – the National Land Service under the Ministry of Agriculture, which is responsible for land parcel formation issues, and the Ministry of Environment, which is responsible for the preparation of detailed territorial plans and construction supervision.

The Law on Real Property Cadastre of the Republic of Lithuania (2000) and Regulations of the Real Property Cadastre (2002, 2003) approved by the Government of the Republic of Lithuania provide for the procedures and ways of

forming real property objects. Real property formation is a set of rules, measures and actions that enable the creation, modification and liquidation of real property as the object of real rights.

The Law on Real Property Cadastre (2000, 2003) establishes the following ways of forming real property objects:

- 1) creation of a new real property object;
- 2) subdivision of the real property object registered in the Real Property Register into new separate real property objects;
- 3) partitioning of the parts from the real property object registered in the Real Property Register and possessed in co-ownership, and their formation as separate real property objects;
- 4) merging of several real property objects registered in the Real Property Register into one real property object;
- 5) reallotment of the real property object.

Land parcels are formed (Kasperavičius 2015a):

- 1) in the process of preparing land management plans used in the Land Reform upon the procedure established by the Law on the Land Reform in rural areas, while in cities – in the process of preparing detailed plans upon the procedure established by the Law on Territorial Planning (2013) in case land is restored to previous owners and the state-owned land is transferred or granted into ownership free of charge, is sold or leased;
- 2) in other cases – in the process of preparing land management plans, detailed plans or other territorial planning documents upon the procedure established by the Law on Land (2004), the Law on Territorial Planning (2013) and other laws.

Formation of land parcels is performed during the process of cadastral survey. This procedure is executed by the persons having qualification certificates to carry out these works obtained in the manner prescribed by the Law on Geodesy and Cartography of the Republic of Lithuania (2010).

Cadastral surveys of real property means a collection of data on the quantitative and qualitative characteristics of real property, analysis of the current real property use condition, individual valuation of real property objects, preparation of cadastral documentation for land parcels and buildings as well as other real property (files of land management plans or cadastral survey of building), coordination of such documents, legal, economic and ecological justification and approval, establishment of the purpose of use of the objects, special use conditions, servitudes and other statutory restrictions on the economic activity.

The following cases of land parcel formation procedures are possible (Kasperavičius 2015a):

- 1) formation of land parcels, preparation of re-allotment plans and their implementation by changing the boundaries of adjacent land parcels (by

performing re-allotment when a part of one land parcel is partitioned without forming a separate land parcel and is merged with the adjacent land parcel);

- 2) subdivision of land parcels when parts of land parcel are partitioned from the land parcel possessed in co-ownership right;
- 3) merging of land parcels into one land parcel without changing the main purpose of land use given in the land management plan for the land reform except for cases when the main purpose of land use is changed by partitioning parcels of the existing households and forests from agricultural land and forestry land, or by merging land parcels of farmers' households registered in the established manner which general area exceeds 2 ha with agricultural land;
- 4) formation of new land parcels in the state-owned land.

A land parcel formation and re-allotment plan is a special territorial planning document of local level – a land tenure plan – prepared pursuant to the Law on Territorial Planning of the Republic of Lithuania (2013) and the Law on Land of the Republic of Lithuania (2004) and approved by the head of the National Land Service and a person authorised by him/her.

When making re-allotment of land parcels, the main purpose of land use set forth in the land management plan for the land reform shall not be changed except for certain cases. When forming new parcels on vacant state-owned land, the main purpose of land use is defined pursuant to the Procedure for the Determination of the Main Purpose of Land Use and Submission of the Applications to Change the Main Purpose of Land Use, Their Examination and Decision-making approved by Resolution No 1073 by the Government of the Republic of Lithuania as of 29 September 1999.

The plans of land parcel formation and re-allotment on vacant state-owned land are prepared and new land parcels are formed in cases when this territory is not included in the detailed plans, land management plans for the land reform, land management plans for rural development and other land tenure plans which are being prepared.

The plans of land parcel formation and reallotment in the territory of amateurish gardens are prepared in cases when there is a need to change the boundaries of parcels formed in the land management plan for the garden territory, or to form land parcels for common use or other land parcels and to sell or lease the state-owned land to the gardeners' societies, members of these societies, other persons in cases prescribed by the Law on Land Reform (1991, 1997) of the Republic of Lithuania.

Summarising legal acts and regulations in force, the following land parcel formation conditions should be distinguished (Kasperavičius 2015a):

- 1) Agricultural and forestry land parcels should be formed in such a way that allows the rational use of land and does not worsen the environmental and activity conditions for other land users.
- 2) Land parcel boundaries must be adjusted to the natural boundaries (rivers, streams, drainage channels, lakes, ponds, ditches (gullies), a row of trees) or to the layout of buildings and facilities. However, it is possible to form a part of the land parcel to be located over the stream, drainage channel or ditch if:
 - that part of the parcels is connected with the main part of the parcel through a bridge or a culvert;
 - a partitioned land parcel is merged with the adjacent land parcel having an access road;
 - a partitioned land parcel has an access road.

When a large piece of arable land, meadows and forests is divided into smaller parcels, the land parcels formed must be compact, rectangular or similarly shaped and have a rational layout.

In all cases water body (lake, pond) is formed as a separate land parcel.

- 3) The boundary of land parcel along private or subject to privatisation streams and ditches is designated in the middle of the stream or ditch.
- 4) The land parcel along the railways, roads of national significance with the established lanes is formed by adjusting the boundaries of land parcels to the lane boundaries. In case of other roads the boundaries of land parcels are set within 1 m from the road embankment or outside edges of the excavation or within 2–3 m of the road planting, or 1 m from the roadside ditch edge.
- 5) Areas of land which are separated by main and national roads, streets, railroads, hydrographical objects which cannot be privatised are formed as separate parcels.
- 6) The forest land parcel being formed includes: forest land (except for the land which is allowed to change into other lands subject to the established procedures) and the land which is allowed to be afforested in the manner established by legal acts as well as other land areas if they make not more than 10% of the total land parcel area when the area does not exceed 10 hectares, and not more than 1 ha when the parcel area exceeds 10 hectares.
- 7) Agricultural and forest land parcels should not form narrow strips along water bodies or forest quarter lines.
- 8) Every land parcel should have access by the road in common use or by establishing road servitude.
- 9) When partitioning a household land parcel from the agricultural land parcel, the household land parcel should be formed to include the structures

of homestead, garden, other homestead plantation, yard and the land area regularly used for a kitchen-garden.

- 10) The land parcel boundary should not be closer than 3 meters to the existing building walls and mature trees (or not closer than a wood crown), unless the landowners agree otherwise.
- 11) Only one land parcel can be formed by the structure or facility, which is necessary for the maintenance of this structure or facility in accordance with its direct purpose recorded in the Real Property Register. Land parcels formed for the maintenance of structures or facilities shall not be subdivided except for cases where land parcel is subdivided or a part from common property is partitioned together with the subdivision of the structure or facility or partitioning of its part from the common property. In that case a separate structure or facility is formed while the land parcel necessary for the maintenance of this structure or facility should function as a separate object.
- 12) The boundary of land parcel along the fence or perennial plantation edge is established by attributing fence or perennial plantation to the parcel owned by the fence or perennial plantation owner, or the boundary of such parcel lies in the middle of the fence or perennial plantation in case the fence or perennial plantation serve both land parcels unless the land owners agree otherwise. If it is impossible to establish the boundary, each land parcel should be attached parts of land of the same size; however each newly formed land parcel must have the same area as the existing legally registered land parcel.
- 13) Areas of land where the power line poles and other objects of engineering infrastructure are situated, which maintenance requires not more than 0.01 hectares of land, are not formed as separate land parcels. Restrictions on the use of such land are set in the manner prescribed by legal acts.
- 14) Land parcels formed in the territory of amateurish garden must not be smaller than 0.04 ha and not larger than 0.12 ha, and when a land parcel is formed by attaching state-owned land, which the owner wants to buy, to the existing land parcel, its area must not exceed 0.16 ha of the total area.
- 15) When forming land parcels in the territory of amateurish garden allocated to the gardeners' society which gardeners' society wants to buy or rent from the state, such land parcels may include land necessary for construction and maintenance of structures of this society (except for roads and street) and land areas in common use used for recreation.

Thus, it can be said that formation of land parcels as real property objects should be done using cadastral surveys, i.e. cadastral data should be determined using precise surveying instruments by measuring the coordinates of land parcel vertexes. Unfortunately, in many cases formation of land parcels ignores the key

topographic elements of the territory: roads, railways, forests and plantation areas; it also fails sufficiently to take into consideration the boundaries of territorial planning or protected areas (Kasperavičius 2015a).

Cadastral data file of real property object consists of:

- 1) Plans of a real property object;
- 2) Cadastral data forms of a real property object;
- 3) Documents, on the basis of which the cadastral data of real property object are recorded or amended in the Real Property Cadastre.

Plans of real property object should be prepared in the manner which allows identifying the location of the real property object within the territory of Lithuania using the data of the national coordinate system. The prepared land parcel plan must be agreed with the state authority responsible for administration of land management works.

Cadastral data of real property objects are collected by the persons having surveyor's qualification certificate issued by an institution authorised by the Government in the manner established by the Law of Geodesy and Cartography (2010) to carry out precise surveying of objects of the Real Property Cadastre, except the cases where in the process of the land reform land parcels are formed in the manner prescribed by the Law on Land Reform and the cadastral data are collected by the persons holding qualification permits issued in the manner prescribed by the Government.

Persons collecting cadastral data of real property objects have the right to access the real property owned or managed by a person wishing to identify the cadastral data, to carry out the works for collecting cadastral data in adjacent land parcels if it is required for collection of the cadastral data. In such a case the owners or users of adjacent land parcels must be notified thereof in the manner prescribed by the Regulations on Real Property Cadastre and their consent must be obtained.

Legal background for recording and amending cadastral data of real property objects in the Real Property Cadastre is as follows:

- 1) decision of the state authority or government institution;
- 2) court decision, ruling, judgement, order;
- 3) transactions in written form;
- 4) documents from other state cadastres and registers;
- 5) other documents specified by laws and the Government.

Together with the documents regarding the recording of cadastral data of real property object into the Real Property Cadastre or their amendment the following must be submitted to the Keeper of the Cadastre: a request to record cadastral data of the real property object into the Real Property Cadastre and a cadastral data file of the real property object.

Example for provision of real property cadastral map data to interested persons is shown in Figure 2.11.

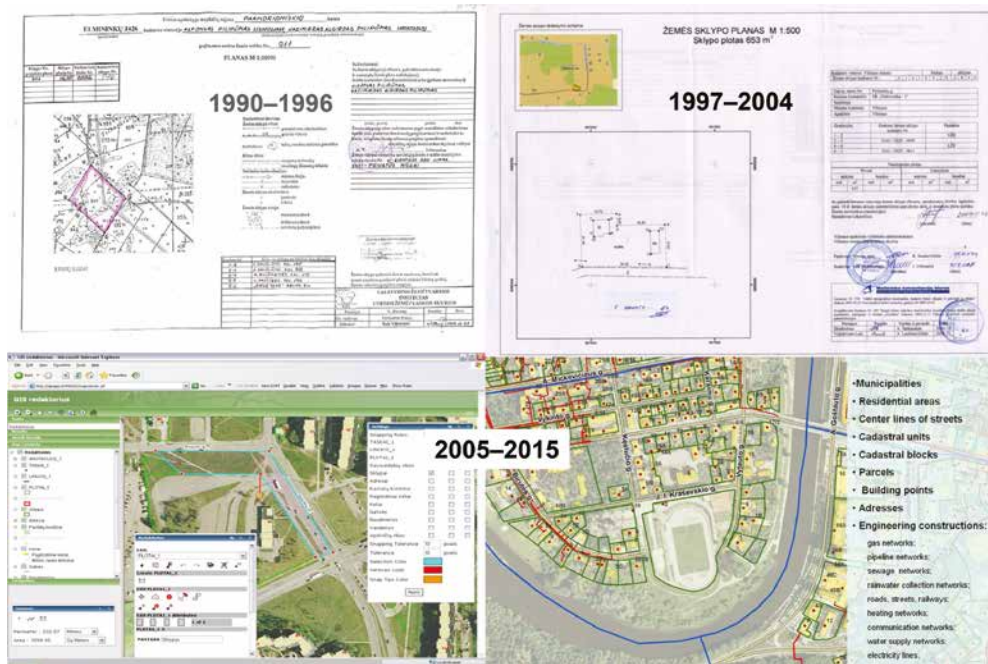


Fig. 2.11. Excerpt from the cadastre map

2.6.3. Mass Valuation of Land

Land is the foundation of welfare of a nation and its people. Individual owners can strive for welfare by developing and expanding their property; whereas the state does so through property-based taxation. These two elements are interconnected. The rising value of property increases the income of the state, while a balanced property tax system encourages economic growth and the development of land and other real property.

In the context of land and other real property taxation, the term “value” has a few meanings. Until 1990, due to the lack of private property and the absence of land market in most Central and Eastern European countries, the value of agricultural land was expressed in a soil productivity grade and the soil’s potential in growing produce. In urban areas information about land was geared towards building gratuitous housing and the needs of centralised city planning. By combining these methods with a centralised planned economy, land and building cadastres that contained exhaustive useful information were created. With the implementation of market-oriented reforms, such work almost stopped.

At the moment, cadastres across Europe are based on the concept related to land management safety, the regulation of property rights and the support of the value-based taxation of land and other property. After the restoration of private real property ownership in the states that underwent economic reform, a property taxation system was introduced, and characteristics that are no longer necessary to collect were re-evaluated. It is admitted that cadastres should collect only the information that is required for registration of rights, determination of land value and taxation of property, resulting in facilitation of the land market operation and promotion of sustainable development.

In Western countries land value was always understood as an economic term, generated by employing property, or as the land's potential in fulfilling the needs of natural persons, businesses and governments. In this context value meant the price agreed upon by the buyer and seller of property who possess information, when the property appears on the market. Value is not a fact: it is the calculation of a possible price of land and other property at a given moment. Value depends on the type of market transaction and the motives and interests of the involved parties.

Under market economy conditions the valuation of land and other property falls into two interconnected but different categories, such as individual property valuation and mass property valuation. Both methods of valuation establish a market value, which is described as "an estimated sum, which the buyer is willing to pay and the seller is willing to get for the property on the day of valuation <...> when both parties being fully informed acted in a prudent way without any compulsion". Both methods are based on the same principles; they undergo economic analysis.

Individual valuation is usually performed using the data on various transactions, such as sales, lease, mortgage, gift, inheritance, as well as the data obtained through reports and accounting. The interested party usually hires a licensed private property valuer, who is eligible of becoming a member of a professional association. The valuer performs market analysis, calculates the value of the property in question and informs the client by submitting a valuation report. The value or price of land given in the report is dependent on the reason for which the calculated value is needed. For example, the value of a building, when assessed for insurance purposes, cannot be equal to the price offered at the auction or on the open market. Calculating property value is more art than science, and it is dependent on numerous outside factors, as well as the physical nature of land or other property.

It is possible that the value of the same property differs when assessed by several professional valuers. Because of that, disputes may arise between the parties involved in the transaction or with institutions that are interested in concluding the transaction, for example, in case property belonging to the state

is being sold, privatised or acquired compulsorily and different valuers propose different values for the property.

Problems may also arise regarding quality control of professional valuers' work, which is partially performed by the professional community of valuers by creating and improving international valuation standards and adopting a code of professional ethics. The government should support this activity and encourage openness and transparency in valuation process.

When performing individual valuation, all efforts are focused into a concrete property unit, while mass valuation analyses multiple similar property unit groups. *Mass valuation* (also called mass valuation for taxation purposes) is the valuation of a property unit group on a given day, using common data, applying standard methods and statistical verification. Mass valuation models are the interaction between supply and demand on the real property market, expressed in mathematical form.

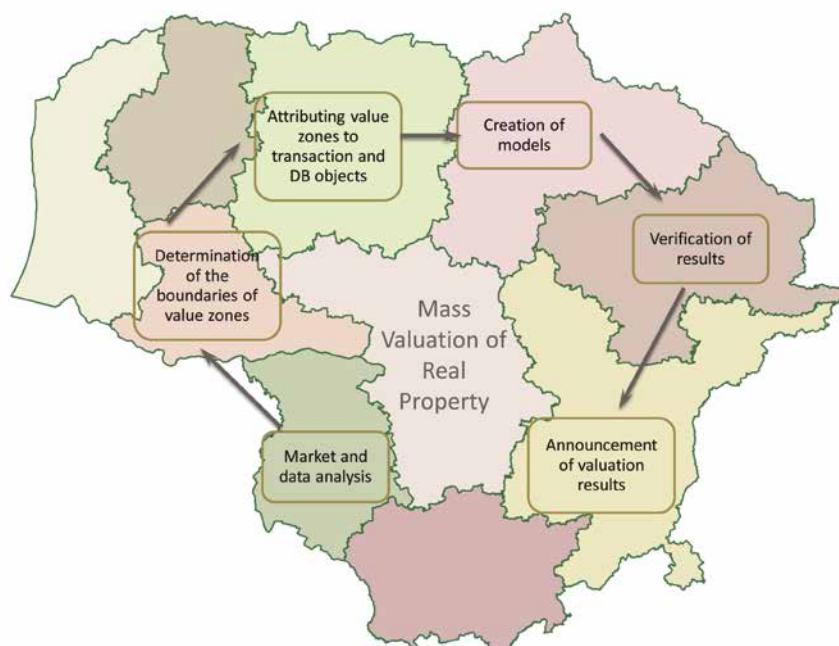
Mass valuation is performed for the purposes of property taxation, however if an appropriate system is created, the data gathered through mass valuation can be used in performing land market analysis, valuating price index tendencies, supporting strategic solutions at both the local and the national levels and evaluating compensation level in a proposed development project. For example, in Lithuania a few legal acts have legitimated the application of mass valuation results for other purposes, such as in selling and leasing the state-owned land, granting social support, calculating fees for land parcel registration and property inheritance tax.

The creation of a computerised mass valuation system and its application in practice provides the possibility to standardise and automate individual valuations and to identify the main criteria and factors that influence the value of a property. This process is complemented by supplementing computerised mass valuation with spatial data and by using geographic information systems.

Mass valuation should be based on political decisions regarding the taxation of property and an appropriate legal framework. The process consists of the following: creation of mass valuation models, tools and procedures; assurance that valuation experts are provided with a specialised education background and training of state officers involved in the mass valuation system; creation of a network of all valuation companies in the country and their united administration; creation of a quality control system that would ensure consistency and uniformity in mass valuation results when valuating similar property unit groups across the country; collection and analysis of data about the land market, as well as other data used in mass valuation models; maintenance and updating of mass valuation database; creation and implementation of a public appeal system.

When putting into practice the public interest, mass valuation is performed directly by governmental institutions or by private sector professionals

commissioned by the government and bound by rules and procedures developed and passed by the government. Mass valuation cycle is depicted in Figure 2.12.



2.12. Mass valuation cycle

When taxing buildings and land, it is crucial to apply identical valuation methods across the entire country.

The volume of work in mass valuation requires coordinated governmental action at all stages of the system. Creating a national mass valuation system does not necessarily mean that the country is prepared to introduce a certain property tax system. For this purpose communication between valuation agencies, cadastre institutions and registries must be established, legitimised and regularly maintained, which is crucial for the implementation of a property taxation system, because determination of precise taxable value of individual property units is only possible by combining mass valuation and cadastre data. Tax inspectorates decide on taxpayers and tax amounts to be collected according to the information on taxable value of individual property units and ownership rights. Technical difficulties may arise in the countries that have only recently started creating their own property cadastre systems, though these problems can usually be avoided when a single institution is assigned to perform all land administration functions.

Central or local tax institutions are usually the recipients of information which is delivered from the land administration institutions responsible for valuation.

The effectiveness of their communication is dependent on the creation of certain information links between computer systems. Data exchange between these institutions can help control and improve tax collection; whereas it is possible to improve the process of information exchange by implementing a geo-referential system that includes data about individual land parcels. However, in some countries open information flows are hindered by legal acts that forbid data exchange between tax institutions in order to protect taxpayers' private data.

When setting the value of land or other real property, valuers should clearly distinguish between the terms "price", "market", "costs" and "value". The term "*price*" usually means the value of the sale, transaction and exchange; "*price*" is the accomplished fact; it indicates the amount that a concrete buyer agrees to pay, while a concrete seller agrees with the proposed conditions of the transaction. In general, the aforementioned circumstances reflect the conditions of one or more markets. The term "*market*" refers to the totality of agreements that is reached by the buyer and the seller using the price mechanism. Market can be defined by the geographical aspect, the product aspect or the product qualities aspect, as well as by the number of possible buyers and sellers and other characteristics. Real property market is the interaction between persons who trade their rights to real property for other assets, such as money. The concrete real property market is defined according to the type of property, location, potential to generate earnings, typical characteristics of investors and lessees and other features recognised by the persons participating in real property trading. Some examples of the real property market: new individual houses or older apartments that can be renovated, located in a central business district.

Valuers use the term "*costs*" when referring to production instead of exchange. Costs may be the accomplished fact or a current price calculation. Valuers differentiate between several types of costs: direct costs, indirect costs, construction costs and development costs. Direct costs encompass costs on work force and materials, also called fixed costs. Overhead costs of a contractor and profit are considered to be direct costs. Indirect costs incurred during construction also include other costs, excluding costs of work force and materials: for example, administrative costs, proprietor's costs on hiring professional specialists; expenditure on financing, insurance, taxes and interest during construction; lease costs, considered to be the net cost of realising the project until the person starts utilising the property. Indirect costs are sometimes called additional costs.

Construction costs or the price offered by the contractor usually consists of direct costs of work force and materials combined with the contractor's indirect costs. Development costs are the costs incurred while creating the property, including the acquisition of land and its preparation for use. These costs are separated from construction costs. The profit of the contractor implementing the project is also included under development costs.

Expenditure related to real property is directly dependent on the price of goods and services on the competitive market. For example, expenditure on roofing, brick walls, architectural plans and renting scaffolds is calculated by taking into consideration supply and demand in concrete territories and by considering the influence of social, economic, governmental and environmental factors.

The term “value” can have multiple meanings in mass valuation systems. Its meaning is reflected by the relationship between price, market and costs. The definition of the term used is dependent on the context of use. In the context of markets, value is usually understood as profit to be gained in the future. Since value exists at a given concrete moment, valuation also reflects value at a concrete moment: it is the monetary value of the property, goods or services provided to the buyer and the seller. Valuers tend to avoid using the term “value” in order to avoid confusion: in most cases valuers refer to concrete values, such as market, investment, use, taxable or other concrete forms of value. The greatest attention in performing real property valuation is paid to the market value and its calculation (Kasperavičius 2015a).

Valuation systems used in Lithuania correspond with the International Valuation Standards (IVS):

- 1) valuation based on market value;
- 2) valuation by applying institutional methods (partial market methods).

During the real estate market formation 1992–2003 institutional methods were used. In Lithuania institutional methods were constantly improved in order to approximate to the average market value set by using valuation market methods. From the administrative perspective, real property valuation has a very concrete and defined goal, and is dependent on the nature of the process where property is involved or is planned to be involved.

The institutional valuation method was used when the process involves property without changing the nature of the activity:

- 1) when carrying out bookkeeping, audit;
- 2) when performing cadastral valuation;
- 3) when taxing property;
- 4) when declaring property.

When changing the farming, legal and economic status of a property undergoing valuation, the property is administered using *the market value determination method*. In this case market based valuation method is usually applied when performing certain procedures:

- 1) when selling state-owned and municipal property;
- 2) when taking property for public needs;
- 3) when investing into real property;
- 4) when executing public procurement;

- 5) when concluding purchase-sale contracts, exchange contracts;
- 6) when mortgaging, insuring and leasing.

In transition period real property administration was mostly based on institutional valuation. A benefit of these methods is the possibility for any person to independently determine property value by using the official data announced on the Internet and in the Official Gazette.

These methods were used in land parcel valuation:

- 1) determination of a nominal indexed price;
- 2) determination of an average market price.

The nominal indexed price was started to determine according to the Resolution No 909 of the Government of the Republic of Lithuania as of 6 December 1993. This price was recorded in the Real Property Cadastre and Register and was used to determine land tax and land rent. The price of a land parcel, when determined according to the nominal indexed price, is based on the productivity of the land and is mostly used to describe land for agricultural purposes. Prices determined by this method for urbanised territories, including such territories in rural areas and in the areas of gardeners' societies, differ very much from average market prices and market prices. The following reasons are the main factors behind such differences:

- 3) method of determining land productivity (productivity rating) is outdated;
- 4) base price per hectare of land is outdated;
- 5) adjustment of the urban ecological coefficient is not so quick;
- 6) evaluation of price differences between the central location and outskirts of an urbanised territory is insufficient.

The nominal indexed land price was successfully used during the initial land privatisation. During this period many land parcels in use were being transferred to the owners of households, gardens and homesteads in order to achieve one of the main goals of the land reform, i.e. to create a land market in Lithuania.

From 2003 mass valuation has successfully changed institutional approach in the valuation area for state needs.

Real estate mass valuation is performed according to the following main principles:

- all property is valued;
- a single valuation methodology is applied and the same technologies are used;
- market data is used and market value determination methods are applied;
- valuation is performed without inspecting the property on site but by using the databases of the Real Property Register and of other registers;
- all processes that are necessary for valuation and submission of the results are automated as much as possible;

- valuation is carried out over a short period of time until the fixed date;
- a collective valuation report is prepared;
- valuation results are automatically tied to taxation objects and property owners as registered in the database of the Register;
- general management of valuation works is performed;
- highly qualified specialists of various disciplines participate in the valuation process;
- valuation works are performed with the least possible expenditure, compared to other methods of valuation.

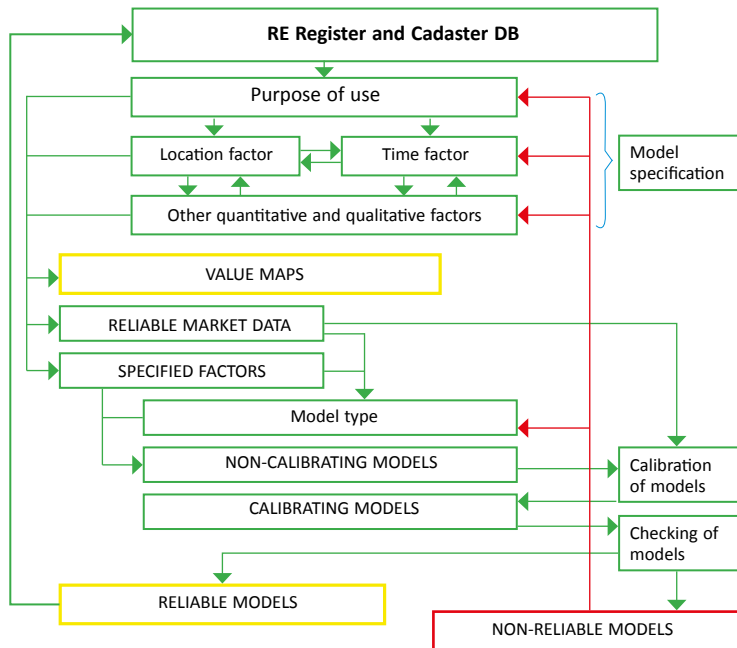
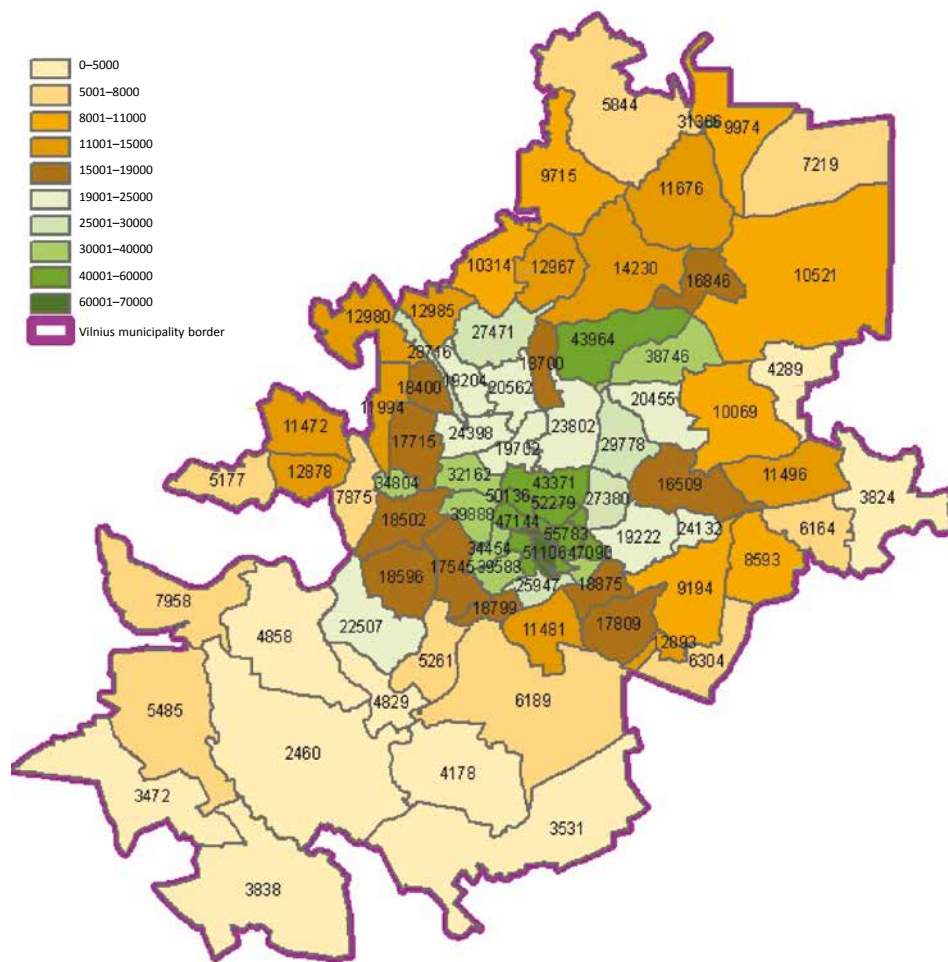


Fig. 2.13. Mass valuation model

Average market prices are determined according to the actual results of land sale-purchase contracts. A market activity index, called location adjustment coefficient, is determined in a specific area. Average market prices are determined in accordance to the types of activities performed or to be performed in a specific land parcel, which are determined by the differences in main purposes of land use and market influences. Land parcels are classified according to the land use: land for commercial purposes, household land, industrial and warehousing land, land of gardeners' societies and agricultural land. This method for determining values is also called the mass land valuation method.



Source: Centre of Registers

Figure 2.14. A fragment of value zones map of agricultural land

Mass valuation system is built on the integrated digital data of real property cadastre and register. It is fully automated. Mass valuation results are public and published on the Internet. Mass valuation results are easily applicable for decision making on different issues (Bagdonavičius 2015) (see Fig. 2.13).

An example of a map prepared using the mass valuation method is given in Figure 2.14. Land has been valued since 2003 using mass valuation models based on the sales comparison approach rather than soil productivity. The valuations for tax purposes are valid for five years, the most recent revaluation being in 2013. In 2014, 2.2 million land parcels were valued, 1.2 thousand value zones created and 288 valuation models developed (Bagdonavičius 2015).

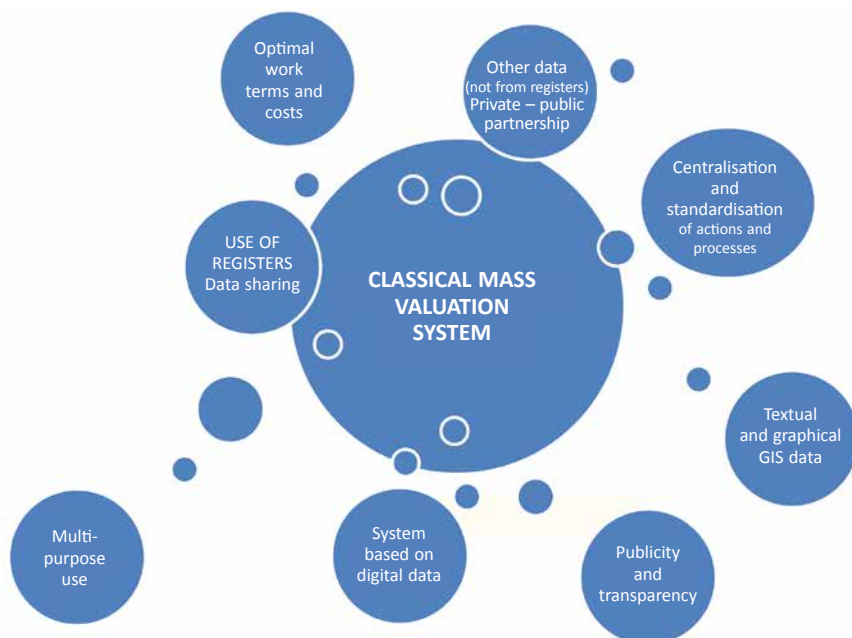


Fig. 2.15. Lithuanian approach to mass valuation

Mass valuation and zoning is based on the regressive analysis of sales data. A value zone is established for the same type of real property. Different formulas (models) are created for every value zone in order to calculate the value of different types of real property. The results of mass valuation are presented to interested institutions and to the society. The mass valuation procedure includes the main elements of computerised mass valuation, which are also used in other countries.

The tax base of land (excluding buildings) is the taxable value of private land. Land tax is calculated in accordance to data of the Real Property Register that is submitted by the Centre of Registers to local tax inspectorates annually before April 1. Annual real property tax for enterprises and organisations is 1% of the property's taxable value (excluding land). Annual land tax tariff is 1.5% of the land's price (or the price of forestry land, excluding the price of timber). The real property tax reform is continuing. The key legislation has been prepared but still some essential adjustments are required in order to have the effective tax reform.

Lithuanian approach to mass valuation is presented in Figure 2.15. Institutions that participate in mass valuation process and use mass valuation results are presented in Figure 2.16.

Estimated value reflects the current real property market and property conditions. Mass valuation results are public and published on the Internet. Mass

valuation results are easily applicable for decision-making on different issues. Need for and use of mass valuation data is expanding.

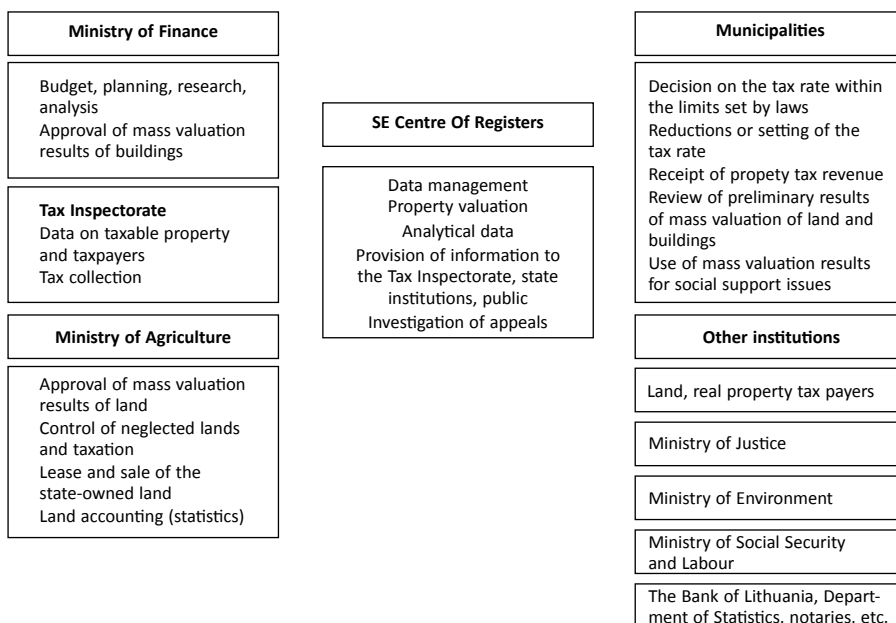


Fig. 2.16. Institutions that participate in mass valuation process and use mass valuation results

2.6.4. Information Systems for Property Registration and Administration

The State Enterprise Centre of Registers is delegated to develop and maintain the Real Property Administration Information System. The Enterprise can independently perform its basic functions using its own technical and human resources, but the extent of activities requires using external capacities. The use of external resources and services is economically justified as it is usually related with the short-term specific challenges. Technical tools are mostly used for introducing new technologies because their permanent possession at the enterprise is much more expensive. External technical and human resources are used for technical upgrade of the information system, licensing and maintenance of the standard software, and in some cases for expanding the system. External service suppliers, namely Oracle Inc. and ESRI Inc., can be mentioned among the other since their software products make the background of the Real Property Register and Cadastre information system. Their products are used for the following main areas (Kasperavičius 2015a):

property transactions and ensure faster and better quality services to the population, to introduce online provision of official real property register and cadastre information by electronic means to notaries and transacting parties at the notary's workplace, to automate the preparation of transaction data and documents, the registration of rights, legal facts in the Real Property Register and the storage of these electronic documents (Kasperavičius 2015a).

Before implementation of the project, residents had to conclude a real property transaction at least two times visiting the Centre of Registers: the first time to submit an application for a certificate on registered real property, and the second time to collect the certificate required to conclude a transaction. Real property transaction procedure was rather complicated, time-consuming and inconvenient to counterparties and employees of various institutions involved in the transaction procedure (see Fig. 2.17).

After implementation of the project, the procedures for real property transaction have simplified significantly. Parties to transaction no longer need to visit the Centre of Registers, as the transaction can be concluded just at the notary office. The registration of rights can be ordered there as well and the prepared registration documents collected. Property transactions are drafted using modern electronic tools, working online with the real property central data bank. Principles of the procedures for the project implementation are illustrated in Figure 2.18.

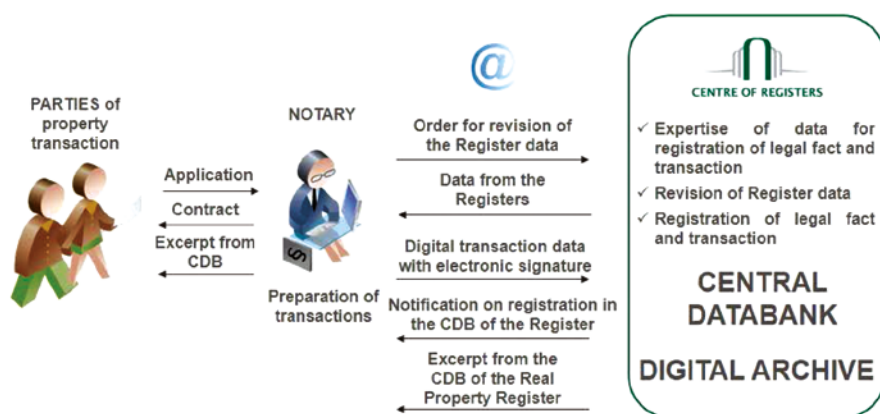


Fig. 2.18. Real property transaction procedure after implementation of the NETSVEP IS project (Kasperavičius 2015a)

This novelty provided an opportunity to deliver services more efficiently and better quality to natural and legal persons; in addition, real property transactions have become much safer. Electronic system prevents from illegal manipulation of real property and falsification of documents. Notaries attest the documents of

real property transaction and operations related to the registration of ownership in the Real Property Register database using electronic signature certificates.

The envisaged outcome was achieved, it means a public electronic service for real property transactions to the Lithuanian people was developed and implemented. In addition to the main use, the system can be used for development of other public electronic services and to improve access to official information. The main economic benefit of the project to the Lithuanian citizens and legal entities is a simplified real property transaction process: time for ordering and collecting registry documents is saved; the time of parties to transaction (residents) is also saved, shorter terms for documentation of transaction and registration. From the very beginning the NETSVEP IS project was designed for all citizens and legal persons of the country possessing real property or the rights to it or seeking to acquire it throughout the territory of Lithuania, regardless of social status, gender or place of residence and the location of the property.

Results of NETSVEP IS project (Kasperavičius 2015a):

- 1) One-stop-shop principle implemented – parties to transaction communicate only to a notary. Notary is a main user who directly communicates with the parties to transaction, drafts documents and attests transactions.
- 2) NETSVEP IS is a tool for concluding a real property transaction.
- 3) Notary has access to the information on real property objects and on the parties to transaction from the Registers of Real Property, of Legal Entities, of Residents, of Addresses, of Mortgage and other registers maintained by the Centre of Registers or the data thereof it is using.
- 4) Integrated environment developed, namely, all actions are performed within a single system.
- 5) Digital transaction documents, which are signed using e-signature, are automatically transmitted to the Centre of Registers.
- 6) History of conclusion of the documents is transmitted together with each document: who and when drafted, modified, attested the document and similar.
- 7) Documents of attested transactions are stored in the individual archives of notaries.
- 8) Each notary has access to own documents only.
- 9) Archive documents are not subject to editing; however they can be used as templates for new transactions.

System for Public e-Service for Municipalities (REGIA)

REGIA is a tool specifically developed for municipalities: their people, civil servants and therein operating businesses. Purpose of REGIA is to create favourable conditions for geographically-based decision-making and to facilitate the exchange of information between residents, legal entities and municipalities.

The system is based on the Lithuanian real property cadastral map and therein integrated data of three base state registers: Addresses, Legal Entities and Real Property. The system enables users to create and manage their own data layers. The service is easy to use and all services are managed through the web browser. It is up to the user to decide whether his data layer is publicly visible and who is entitled to use it. REGIA services are publicly accessible in the review mode and do not require a user's registration.

REGIA operates on the cloud principle, it means that any information created by a user, data recorded, uploaded documents are accumulated and stored in the REGIA servers and are accessible from any computer. REGIA principal scheme is presented in Figure 2.19.

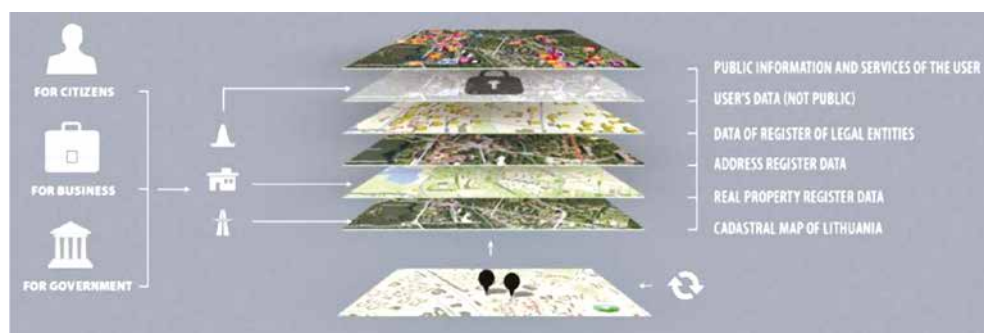


Fig. 2.19. REGIA principal scheme

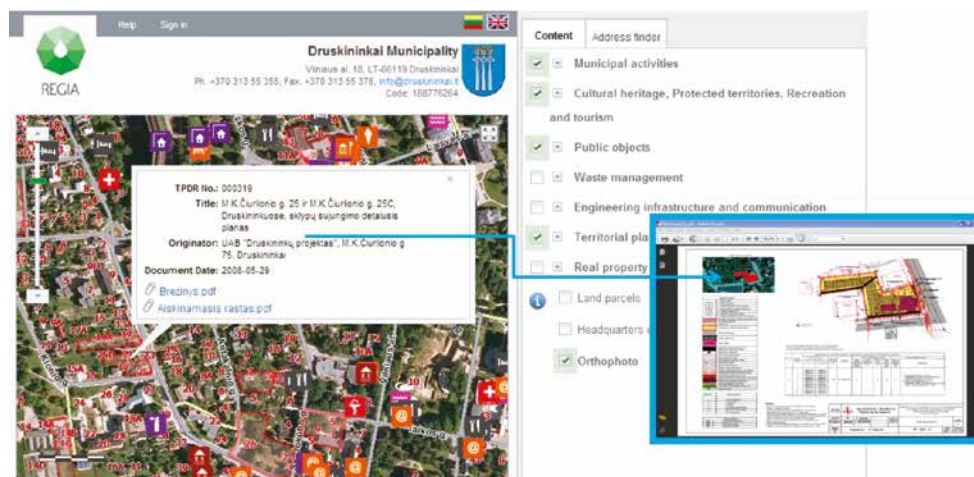


Fig. 2.20. REGIA review result

Users may find relevant information on the REGIA map at any time, such as:

- addresses;

- operating enterprises, institutions and organisations;
- real property objects;
- data on real property market analysis, mass valuation of real property and other;
- data on energy performance certification of buildings;
- information on cultural heritage objects and similar.

Through the REGIA integrated interfaces a user is directed to the databases of the registers in order to obtain data from the registers administered by the Centre of Registers and by other registrars (Fig. 2.20).

All municipalities today are using the REGIA service. The information is available to all residents in the country free of charge. For user convenience, a mobile (smart mobile phones) program is created for individuals to notify the municipality of any event or fact they have noticed and to keep track of it. The system also allows see information presented by the municipality. Principal scheme is shown in Figure 2.21.

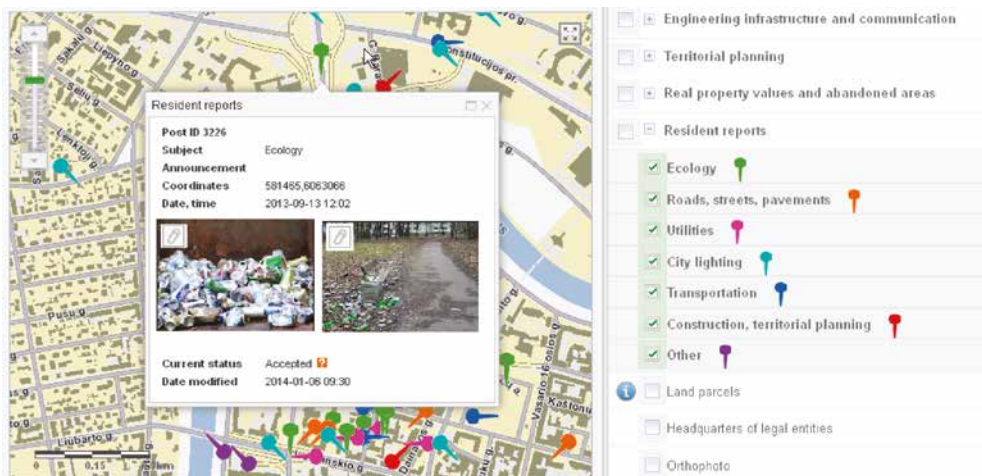


Fig. 2.21. Principal scheme for displaying a message

REGIA is a handy and simple tool for integrated display of data and prompt management and monitoring of events.

Information System of the Real Property Register

Real Property Register is a dynamic information system of the Real Property Register being developed using the latest information technologies in accordance with the following principles (Kasperavičius 2015a):

- Main components of the Real Property Register information system (Real Property Register database, database of archive files movement, database

of accounting of services provided, and database of electronic document archive) are stored in the database of the head office of the Centre of Registers using the Oracle database management system (Real Property Register operation diagram is shown in Fig. 2.22).

- Software applications of the above-mentioned components are created using the web scripting technology JSP (Java Server Pages).

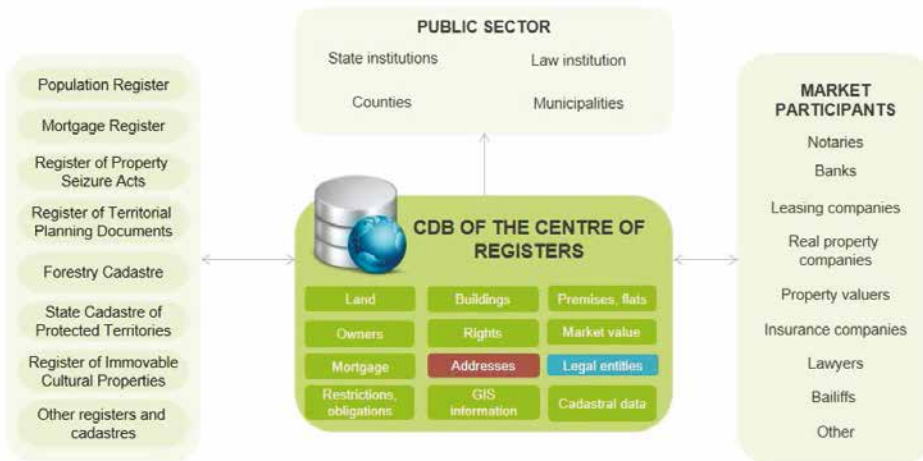


Fig. 2.22. Real Property Register operation scheme (Kasperavičius 2015a)

This technology simplifies administration of the system; it means that the changes made to software applications do not require installing anything extra in the computers at the working places. Usage of application servers for central administration of the database increases security of the information system, the rate and reliability of data update, significantly speeds up the provision of real property information to users as well as reduces the costs for system itself because these procedures do not require specialised software. The use of this technology requires fairly less resources for data transmission networks.

Information system of the Real Property Register is one of the most developed, effective and modern information systems both in Lithuania and in the world (the World Bank data). Information system ensures the provision/delivery of official and legally correct of data to interested parties, including foreign entities. It covers the collection of all data on real properties, their storage and delivery to users (Kasperavičius 2015a).

Geoinformation System of Real Property Cadastre

Graphical information is a prerequisite for effective real property administration, because most of the data are related to geographical position of an object,

namely, location of the real property, its shape and area. In order to avoid disputes over the boundaries of adjacent land parcels, it is not allowed in Lithuania now to sell the land parcels whose boundaries are not in the digital cadastral map. Before registration of a land parcel, all polygons of land parcels and central lines of engineering structures are entered into the cadastral map, the areas and shapes of land parcels are checked, as well as their geographic location in relation to adjacent land parcels (Kasperavičius 2015a).

To prevent occurring of land disputes and to enable surveyors the web-based GIS application “Geo-Surveyor” was introduced. Based on electronic cadastral map it provides surveyors with a private layer of map and tools to plot new land parcels in up-to-date real-life context. Application indicates any occurring conflict with boundaries of existing property or infrastructure. It even lets to observe preliminary projections of other new parcels plotted by other surveyors to keep context in mind (see Fig. 2.23).

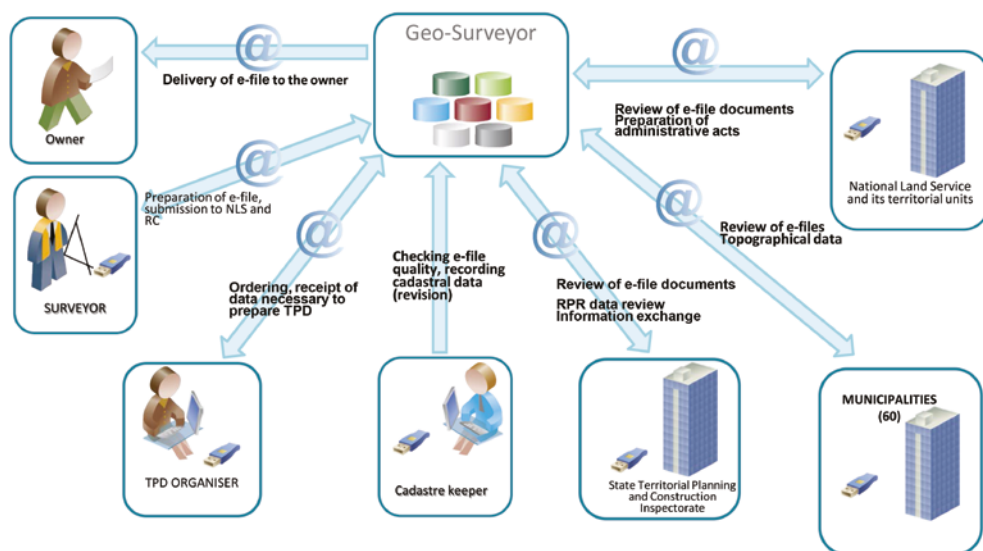


Fig. 2.23. Information system GEO-SURVEYOR

At the beginning of the land reform and during the restoration of the ownership rights to land, the formed land parcels were registered in the land registry information system without entering them into the digital cadastral map and without performing their control in relation to the adjacent land parcels. Moreover, during the first years of the land reform not fully accurate cartographic material was used for formation of land parcels. Therefore, some land parcels wrong boundaries may be found in the cadastral map with. In 2004, following the order of the National Land Service under the Ministry of Agriculture

the correction and update of the real property cadastre map was conducted. It aimed to analyse the most common errors in the cadastral map, the phases for its adjustment and update, and to provide map fragments with examples.

In the beginning of 2004, a new cadastral map update and management system was introduced. It is used at the GIS workplaces of the Branch Offices of the Centre of Registers to enter land parcel boundaries into the cadastral map, to check with regard to the adjacent land parcels and at the same time to transfer to the central GIS database.

The project “Development of the infrastructure of Lithuanian geographical information” (LGII) (EC 2015) was conducted according to the measure 3.3 “Development of services and infrastructure of information technologies” of the General Programming Document for 2004–2006, with the support from European Regional Development Fund. The responsible manager of the project was the state enterprise Remote Sensing and Geographical Information Center “GIS Center” in partnership with state institution and enterprises which regulate or conduct accumulation and management of official geographical data.

As the result of the project a set of measures has been elaborated which are necessary for creating a modern and comprehensive national system for transmission of geographical information which can guarantee interface among various sets of geographic data and geographical linkages within state registry and cadastre. In particular, the following results were obtained (EC 2015):

- Creating general model of georeferential data, data base specifications, integrated interfaces among cadastres, registries and registry data bases of state agencies;
- Creating Internet portal for LGII;
- Creating fully functioning national system of meta-data for geographical information;
- Creating national integrated system of geographical information (data base and geographical services);
- Updating, putting in order and supplementing national referential geographical data;
- Creating functioning electronic training system for further training of staff working with geographical data.

In this way the project has contributed to the data flow harmonization within the nation. The harmonization has been achieved by simplifying processes of accumulation, management and application of digital geographical information, while the public use of geographical information has qualitatively improved (EC 2015).

A special program SDEGATE is developed, which provides on-line computer connection between a user terminal and the central GIS database ArcSDE while exporting and importing geodetic data. Web application developed by the State Enterprise Centre of Registers, which is used for providing the cadastral map,

is being constantly improved and it allows users to obtain a view of the cadastral map excerpt from the central GIS database in accordance with a request (Kasperavičius 2015a).

Using new information technologies applied to the exchange of information between notaries and the Real Property Register a special web application was created to generate a cadastral map excerpt and submit it to a notary together with the certificate required for transaction (at the moment – for revision of the register data for transaction). Cadastral map excerpts in paper and digital form are provided to the following users in a convenient format: surveyors, developers, municipalities, Land Management Divisions, keepers of other registers and cadastral and private individuals. Cadastral map is provided through Internet to banks, insurance companies, notary offices, courts, mortgage institutions, real estate agencies, public authorities, private companies, etc. (Kasperavičius 2015a).

In order to integrate the Real Property Register information on buildings and land parcels using the cadastral maps, an application was developed to identify the central coordinates of buildings and enter into the cadastral database.

Advanced software and hardware technologies support timely update and management of the real property cadastre geoinformation system by using the software, such as ArcGIS, ArcIMS, ArcSDE, ArcObjects, AutoCAD, and Oracle (Kasperavičius 2015a).

Information System of the Real Property Market Research and Property Valuation

In 2002–2003 the State Enterprise Centre of Registers carried out the first mass valuation of land on the basis of market situation as of 1 January 2002. The second mass valuation of land (2003–2004) was performed based on the market situation as of 1 July 2003; the third (2004–2005) based on the land market situation as of 1 October 2004. Valuation reports are approved by the Order of the Director General of the National Land Service under the Ministry of Agriculture. Thereafter the following mass valuation documents are prepared: land mass valuation reports and value maps. Those documents are prepared for the territory of each municipality (60 reports), and one complex report of mass valuation of land is compiled for the entire territory of the Republic of Lithuania (Kasperavičius 2015a).

The results of annual mass valuation of land are presented to the county and municipality administrations and the public for consideration. They are available on the website <http://www.registrucentras.lt>. Grounded remarks and comments based on the market data are considered when correcting boundaries of the value zones, revising the valuation approaches and data in the reports. A valuer

aims at making up the land value zones as precise as possible following the valuation rules and at preparing the value computation algorithms so as their use results in the average market values as close as possible to the market values. Having corrected the inaccuracies identified, the reports of land mass valuation and the land value maps are submitted for approval.

In 2005, during the third mass valuation of land, a rise in market prices of land, including agricultural land in rural areas, was noticed in all the municipalities. Higher prices were noticed of those agricultural land parcels with higher land productivity score. To ensure more exact valuation of such land, in 2005 an adjustment coefficient for land productivity score was introduced into the model for calculation of the land value that is used only for agricultural land (excluding amateur garden parcels) and only for those value zones, which cover the rural areas – villages and towns (Kasperavičius 2015a).

The results of land mass valuation are obtained by analysing transactions data in the database of the Centre of Registers and other information on land and other real property market (sales, leasing, and supply) with regard to physical and legal characteristics of the property. The methodology used allows a fairly accurate calculation of land values. The real property market in Lithuania is quite dynamic. Regular growth of land prices is recorded in cities and recently in rural areas. These fluctuations in the market prices must reflect in the results of mass valuation of real property. The improvement of mass valuation of land is encouraged by evolving real property market, improving professional qualification, growing digital information, emerging new advanced computer technologies and increasing market data bank. Lithuania is one of the first Central and Eastern European countries where computer-based mass valuation is almost completely introduced, land information system and other advanced technologies are widely used.

It can be summarised that efficient real property management, cadastre and register system, including mass valuation, and a variety of services is one of the conditions for:

- economic growth in the country;
- sustainable housing, crediting and property market;
- fair and transparent taxation;
- secure ownership.

Improvement of public real property cadastre and register services, use of modern technologies and expansion of eservices is the main focus in creating better business environment. According to Doing Business (2015) report, Lithuania is the ninth (9) among 188 countries in the category of property registration (see Table 2.7).

Table 2.7. Characteristics of property registration in Lithuania (Kasperavičius 2015b)

Indicators	Eastern Europe and Central Asia countries, in average	Lithuania
Number of procedures	5.4	3
Time (days)	23.1	2.5
Expenses (% property value)	2.7	0.8



Fig. 2.24. Aspiration in developing of real property cadastre and register in Lithuania (Kasperavičius 2015b)

With the rapid development of information technologies and creation of e-government in Lithuania in recent years, a need to gradually introduce one-stop-shop principle has emerged. A lot of progress has been made in applying and developing information technologies (IT); however full implementation of e-government would help to overcome various administrative obstacles, to develop a modern management structure based on transfer of information through various channels and ways. Aspiration in developing of real property cadastre and register in Lithuania are provided in Figure 2.24.

The majority of base registers which store information on persons, entities and real property have been already created and are in operation. The Real Property Register, the Population Register, the Register of Legal Entities, the Address Register are running successfully (currently, these four base registers: the Real Property Register, the Population Register, the Register of Legal Entities and the Address Register are handled by one institution – the State Enterprise Centre of Registers). Information about real property is the main component of many national databases which is used in different ways for the needs of

separate economy sectors and the society. Address is a key element for integration of information. It will be impossible without the Address Register to successfully link separate real property address components into a standardised object of the Address Register defining accurate position of the registered object.

It should be noted that it is extremely important for every country to choose a modern approach for the development of real property administration system which is appropriate to the country. Real property administration system in Lithuania was developed and implemented in accordance with the UN ECE Land Administration Guidelines; also the international experience has been successfully used. International cooperation with various organisations offered Lithuania the opportunity to gain knowledge and skills necessary for the creation of real property administration system, enabled to compare various solutions and to create real property administration system that is the most appropriate for the country. The implementation of such system was evidently affected by the development of a new market and economy, rapid technological progress, social changes and emerging relations between public institutions and private business. Despite all achievements, it is very important to develop the international cooperation further, to search for new ways and measures for the improvement of real property administration system, taking into account national and international needs of the public and private sectors as well as the society (Kasperavičius 2015a).

2.6.5. Development Trends of Land Market in Lithuania

Land market in Lithuania started to develop after the restoration of ownership to agricultural land. Active privatisation process was on-going in 1995–1997, and was re-started from 1999. And although the land market was really sluggish, land consolidation and farm restructuring has been slow, there was no land supply and demand balance, already from the beginning of XXI century the number of purchase-sale transactions and land areas under conveyance began to increase (TEGOVA 2012b).

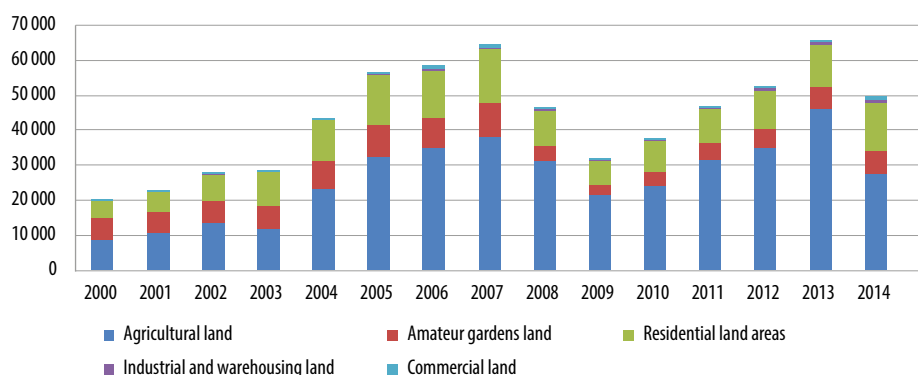
Land restitution in Lithuania was still continuing. At the end of 2002 the number of private land parcels totalled to 1,073.2 thous. and the number increased within a year by 13% (in 2001 – by 11%). Total area of private land was 2,793.8 thous. ha, increased by 10% similarly as in 2001. Private land in total makes 42.8% of the total land area in the country (agricultural land made 57.6% of total land for agricultural purposes, private forest land – 23.6% of total forest area, private residential land – 50% of total residential area).

In 2002, total number of transactions with land parcels increased by 8%, residential land parcels – 15.8%, agricultural land – 3.9%, forest land – 9.5%. The pace of development remained the same as compared to the previous year (TEGOVA 2012b).

Development of land market was slow as well as the consolidation of farming lands and farm restructuring. Even if the average prices in most municipalities have increased, they still remain rather low.

The activity of land market in Lithuania started to increase in 2004. The highest increase in the number of transactions was observed among industrial and warehousing land and agricultural land parcels – even by 56% and 48%, respectively. The transactions of commercial land increased by almost 31%, transactions of parcels for residential housing construction increased by 19%; transactions of garden plots – by 15% since they are often used for residential housing construction when prices for land are growing.

Prices for all types of land have increased compared to 2003. After 2004 activity of the land market continuously increased till reached its pick in 2007: the total number of land parcel transactions in comparison to 2004 increased by 32%. The highest increase in the number of transactions was observed among industrial and warehousing land parcels – even by 59% in comparison to 2004. The transactions of agricultural land increased by 39%, commercial land – by 29%, residential land – by 24% and garden plots – by 18% (Fig. 2.25).



Source: Centre of Registers (2015)

Fig. 2.25. The number of land transactions

Due to economic and real estate market crisis situation in 2008 has changed. Decrease was noticeable in all types of land transactions and in 2009 almost reached level of 2003. In comparison to peak period (2007) the transactions of agricultural land decreased by 44%, commercial land – by almost 60%, residential land – by 55%, garden plots – by 67%, industrial and warehousing land parcels – by almost 35%.

In 2010 land market started to recover and number of all types of land transactions slightly increased. In 2013 a record-breaking activity after the crisis has been observed. There were 38,281 land purchase-sale transactions registered

throughout Lithuania in 2013 – by 18.6% more than in 2012. The majority of them were the transactions on agricultural land purchase-sale. The transactions in this segment made up 77% of all transactions conducted in 2013.

The major activity was in the most productive regions of Lithuania. The capital city was playing the major role in the land market. The majority of agricultural and residential land transactions were made in Vilnius city – 51% and 35% of all transactions, respectively. This significant hike of agricultural land in Vilnius city may be related to the amended law on territory planning, which entered into force since 2014. The law eliminated the necessity to draw up detailed plans in many cases. As a result of the recovering real estate market in Vilnius, a relatively cheaper agricultural land has become attractive to investors.

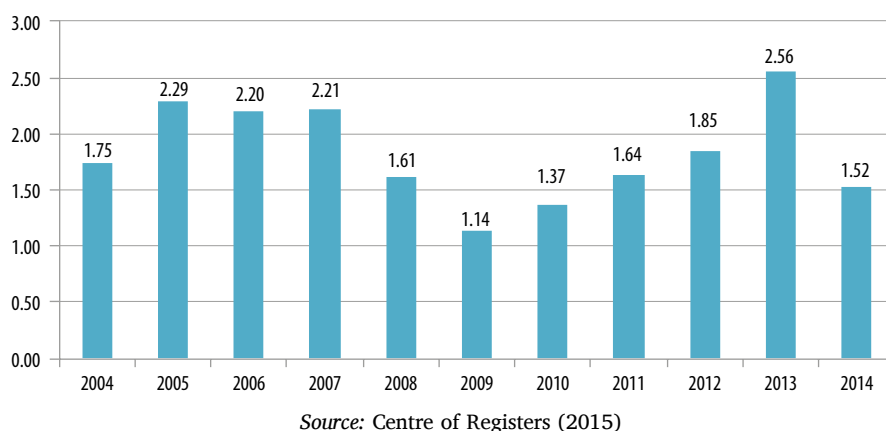


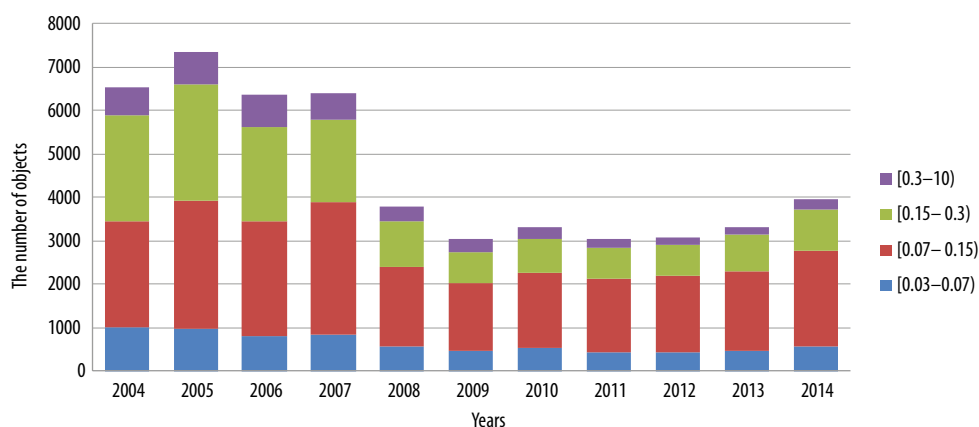
Fig. 2.26. Purchased area (%) of the total area of the territory of Lithuania

In 2014 the activity of land market was variable. Decrease of total number of transactions by 25% was mostly caused by decrease of activity in agricultural market – number of transactions decreased by 67% in comparison to 2013. It can be related to the strengthened law on agricultural land acquisition, which made the alternative of long-term lease become much more popular. It should be noted that the number of transactions has significantly decreased in peripheries however in 2014 the increase in land plot transactions was registered in the major cities and their regions. The main reason for this was an active construction of private semi-detached houses and cottages.

Number of other types of land transactions in 2014 increased: industrial and warehousing land – by 24%, residential land – by 11% and garden plots – by 9%. Increase in industrial and warehousing land transactions could be explained by improving situation in Lithuanian international trade and increase in residential land transactions shows that the residents intend to invest into private houses (Fig. 2.25).

Variable fluctuations of land market reflect in statistics on purchased area of the territory of Lithuania (Fig. 2.26). During expansion period (2004–2007) each year about 2% of territory land was purchased, this number decreased during period of crisis and increased after recovery till reached the highest value in 2013 when 2.56% of total area was purchased. Increase of purchased land could be explained by improving economic situation as well as the amended law on territory planning, which entered into force since 2014. It could be noticed that purchased area each year makes only 1–2.6% of the total territory. This could be explained by popularity long-term lease.

Though number of transactions of parcels for residential housing construction was variable during period of 2004–2014, trends on required area of land parcels remained almost the same. The most popular were residential land parcels of 0.07–0.15 ha. In 2014 the share of these parcels in residential land market transactions was 56%. During the period of crisis demand for bigger parcels of 0.15–0.3 ha slightly decreased. For instance, in 2014 share of these parcels in total residential land transactions decreased from 37% to 24% comparing to year 2004. Demand for bigger 0.3–10 ha parcels remained moderately the same (transactions share of 12–15% through all the analysed period) (Fig. 2.27).



Source: Centre of Registers (2015)

Fig. 2.27. Residential land by the acquired area (ha) in Lithuania

While analysing Lithuanian land market more attention should be paid on agricultural land. In the period of 2002–2006 the area of land designated for agricultural purposes varied very slightly, and on January 1, 2006 there were 3954.6 thousands of hectares or 60.6% of total state land fund in the country. At the beginning of 2002 the private land designated for agricultural purposes comprised 52.8%, and in 2006 it comprised 69.6% of total land designated for

agricultural purposes in the country. In the period of 2002–2006 an area of private land designated for agricultural purposes increased by 31.6%, while the area of state land decreased by 35.5%.

In 2006 a private land designated for agricultural purposes according to land users was distributed as follows: natural persons possessed 97.8%, legal persons – 1.7%, members of gardeners' societies – 0.5% of total private land designated for agricultural purposes. In the same year the structure of state land designated for agricultural purposes according to its lessees was the following: personal farms of dwellers leased 23.0%, natural persons (farmers) – 27.7%, companies and other legal persons – 9.4 person, gardeners' societies – 0.6%, non-provided and non-leased land comprised 39.3% of total state land designated for agricultural purposes.

The land market of land designated for agricultural purposes began to form when the independence of Lithuania was restored, after the private land proprietary was legitimated and the land was started to return to its former owners or lawful inheritors. According to the data of State Enterprise Centre of Registers the Lithuanian market of land designated for agricultural purposes was forming slowly until 2003.

After restoring Lithuanian independence big political, social and economic changes took place in Lithuania. Eastern markets of agricultural and food products were lost, and products non-complying to the Western standards were produced, thus decreasing used agricultural landed property and plot areas, number of livestock, production of different agricultural products (especially stockbreeding), occupation of country people and the level of their receivable and disposable income, also a large part of country dwellers lost their basic social guarantees (Kazakevičius 2014).

Moreover, during the first decade after the restoration of independence the programic provisions of agriculture and country development of eleven governments which governed the country at that time were different. The tendencies of agricultural reform, the priorities of agricultural trade and country development, and the forms of state support were constantly changing (Kazakevičius 2014).

In the first decade after the restoration of independence the macro-economic environment was also not favourable for agricultural trade. Huge economic decline, big inflation (in 1991 – 383%, in 1992 – 1163%, in 1993 – 189%, and high level of unemployment were present. The “scissors of prices” – uneven variation of prices of material resources and agricultural production existed almost during the whole period. The governments wanted to reduce the social tension when reforms started, thus began to restrict increase of prices for food products, at the same time regulating the increase of price for buying main agricultural production. Due to the imperfect governmental politics of price regulation in agriculture the loss was not covered even by imposed material support out of

the support funds functioning at that time. Also, the farmers had poor financial possibilities, the banks demanded a guarantor, and the farmers failed to have it (Fund of Agricultural Loan Guarantees was not yet functioning). Besides, the producers of agricultural production experienced the results of ineffective system of mutual payment for the realized agricultural production. The biggest economic problem was constant late payments from procurement and reprocessing companies (Kazakevičius 2014). It all created huge loss for agriculture and no-confidence in agricultural politics for farmers, as well as uncertainty about the future of agriculture.

Moreover, the land reform executed in 1991 in the country also interfered with the formation of land market. According to the data presented by National Land Office at the Ministry of Agriculture of the Republic of Lithuania, from 1991 till the end of 2003 the citizens of the Republic delivered more than 710.3 thousand of applications to restore the proprietary rights in 4.0 million ha of land located in country terrain. The process of land reform continued slowly in the country. This process was interfered with frequently changing laws and legal acts, controversies between citizens willing to return the land in kind, and local citizens which were given the land by the former owners for developing their personal farm activity. Up to January 1, 2007 691.7 thousands of citizens' applications were satisfied – the decisions to restore the proprietary rights in 3.8 million ha of area in country terrain were adopted. The process of restoring the proprietary right of the citizens to the land is supposed to be radically finished in 2008.

Only after the European Union adopted a political decision on EU development and the Governmental Commission of the European Integration approved on the preparation of Lithuania's membership, the political, legal and economic situation changed in Lithuania. The national legal documents were harmonized with EU documents, the institutions were established for administering common agricultural politics of EU, the laws, strategies and programs regulating the subsequent politics of agricultural and country development were prepared and adopted (Kazakevičius 2014).

According to the data of National Land Office, 15.4 thousand of contracts were made in Lithuania in 2002, whereof 58.1 thousand ha of land designated for agricultural purposes were transferred, and the activity of land market (the proportion of area of private land designated for agricultural purposes realized and gifted annually with the area of total private land designated for agricultural purposes) was 2.8%, while in 2003 respectively – 16.8 thousand of contracts, 58.5 thousand ha and 2.6%.

The market of land designated for agricultural purposes became more active from 2004, when on January 28, 2006 the Seimas (the Parliament) adopted the leading laws of the amendment of Article 7 of the Constitution of Lithuania,

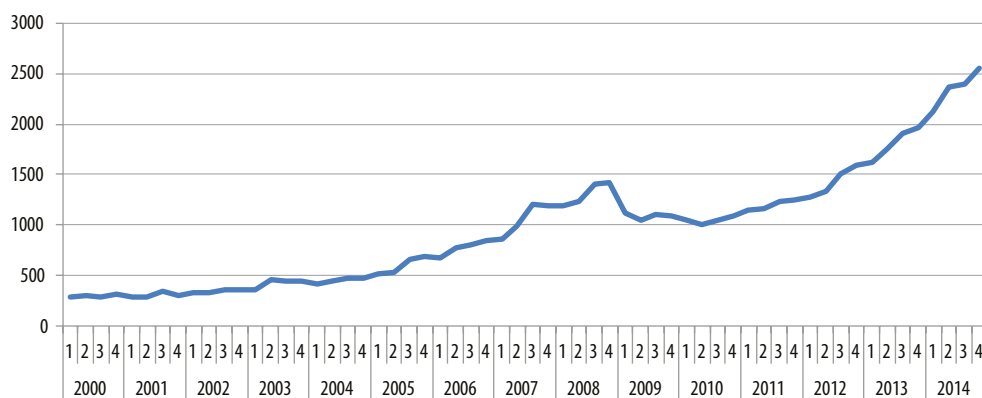
envisaging the conditions of acquiring the land both by foreigners and the domestic legal persons, after adopting the emendations of Provisory Law on Acquisition Land Designated for Agricultural Purposes on July 15, 2004, which changed the order of acquisition the land designated for agricultural purposes, simplifying the procedure of making land contracts, thus expanding the circle of possible purchasers, refusing the requirements for qualifying preparation for farming and moving to the district where the acquired land is located. Moreover, the integration to EU had a big influence increasing activity of land market and support for agriculture. The external macroenvironment of the country became more stable and safer to develop the agricultural and other trade, and the rendered financial support from structural funds of the EU and state national budget, as well as direct pay-outs, allowed to enhance the financial and competitive capability of producers of agricultural production and guarantee the development of agriculture (Kazakevičius 2014). The land designated for agricultural purposes in 2004 was transferred 2.2 times more than in 2003, which is 126.9 thousand ha of land.

The simplified purchasing procedure of land designated for agricultural purposes has influenced the increase of price of land designated for agricultural purposes, which enabled the persons not dwelling in the villages to invest their funds into the property of this land, expecting an increase of their price in future; also low price of land, comparing with prices of other EU countries; improved financial position of the inhabitants and farmers of the country; people's anxiety about unclear consequences of euro establishment, etc. Moreover, after the direct pay-outs for crops and agricultural landed property were received, the land owners raised the price of leased land, which allowed increasing the price of realized land as well.

Although activity of Lithuanian market of land designated for agricultural purposes has been high, it still should not decline because of the present objective and subjective causes: low price of land, comparing with the prices of other EU countries; increased financial capacity of farms and willingness to expand the area of cultivated land; willingness to sell the recovered land having no possibilities to develop the agricultural trade; willingness of foreigners and rich Lithuanians to purchase real estate in Lithuania, as well as the land (Kazakevičius 2014).

The land market of Lithuania is still young, and the land prices comparing with other countries of the European Union are considerably lower. This encourages persons from foreign states to purchase the land designated for agricultural purposes in the name of other persons. Besides, a lot more people fail to cultivate the land recovered during the land reform and try to sell it, while others try to purchase it as soon as possible, thus willing to expand their farms and earn profitably in the future.

According to the data of National Land Office, in 2006 492.6 thousands of natural persons possessed 2690.1 thousand ha of private land designated for agricultural purposes, and 127.5 thousand of personal farms of inhabitants leased 276.8 thousands ha of land designated for agricultural purposes from the state for developing activities of personal farms. Meanwhile, the number of real farming persons is considerably low. This has been proved by the data of National Payment Agency. At the same year 213 thousand of applications were presented by the agricultural subjects on direct pay-outs for the crops, and 110 thousand of applications on pay-outs for land plots less favourable for farming (Kazakevičius 2014).



Source: Centre of Registers (2015)

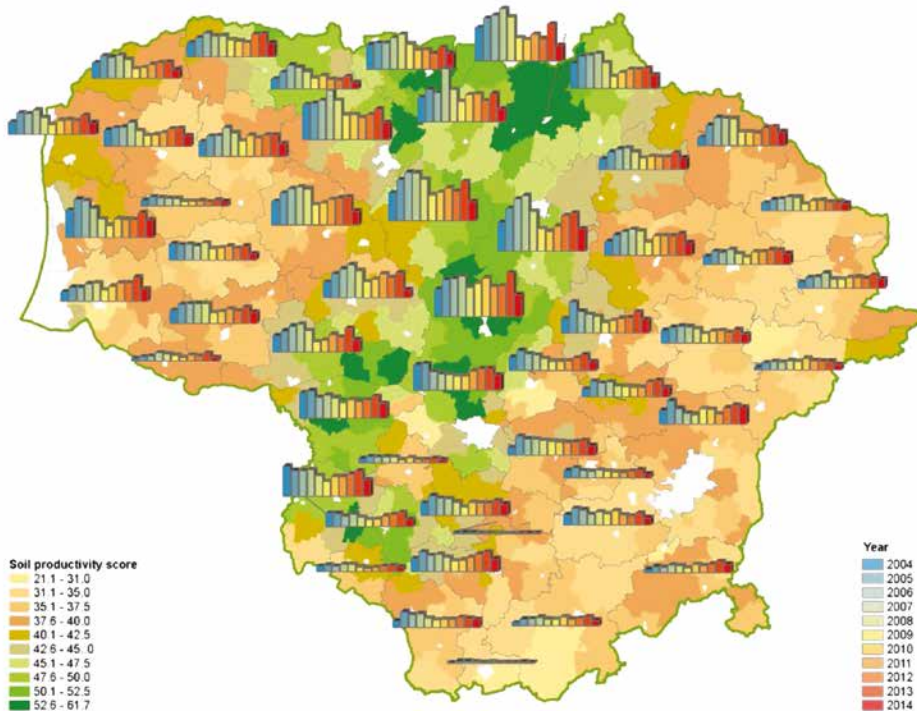
Fig. 2.28. Agricultural land prices (Eur/ha)

The alterations of agricultural land market formation in Lithuania created the pre-conditions for sustainable process to expand land-ownership areas for agricultural entities and to develop more actively the land consolidation process. Therefore, according the confirmed normative documents in the process of land restitution the compact land-ownership areas were structured with exception of separate land reform projects. Generally, the restituted land areas are small.

According to the data of the National Service of Land (Department of LR Ministry of Agriculture), the restituted average land area per heritor was 5.6 ha during the period 1991–2006. Obviously, the farms in Lithuania are too small, otherwise the restituted land is not concentrated as a single area, between public land are dislocated private land areas. The fragmentation (dispersion) of land-ownership and land areas creates the great problems for land users. Average restituted land area per unit is compounded of 2.3 ha (Kazakevičius 2014).

The fragmentation (dispersion) of land-ownership and land areas creates the great problems for land users. Average restituted land area per unit is compounded of 2.3 ha.

Agricultural land market didn't experienced significant prices corrections during the period of crisis and prices sharply increased during the period of recovery (2011–2014) (see Fig. 2.28 for agricultural land prices and Fig. 2.29 for agricultural land transactions in territory of Lithuania).



Source: Centre of Registers (2015)

Fig. 2.29. Number of sales transactions for agricultural land

In 2012 the only increased activity in Lithuanian real estate market was another 5–10% increase in prices in the agricultural land market in 2012. Interest in agricultural land, which started to grow in 2011, continued through 2012. Both direct users of the land (farmers), and speculators, who hope to profit from reselling the land, were interested in agricultural land. The main reason for this interest is that these parcels of land were relatively inexpensive and, depending on location, ranged from EUR 1,100 to EUR 2,900 per hectare. In 2013 prices increased by 10–15%.

In 2014 the introduction of a variety of safeguards for buyers of agricultural land affected the overall trends in this sector. The prices for arable land, which in recent years had been increasing, stopped rising in mid-2014 and a decrease in prices of land was observed. However, to a greater extent this affected less fertile types of land, because they were no longer attractive to businessmen who

received support from the European Union for carrying out certain activities. On average 5% decrease in prices were recorded in the agricultural land market in 2014. Depending on location (land productivity), agriculture land prices ranged from EUR 1,000 to EUR 3,500 per hectare.

For the attainment of the singleness competition for Lithuanian farmers, the fragmentation of land should have to be reduced and the land areas have to be enlarged. Land consolidation is discussed in the next Section.

2.6.6. Land Consolidation in Lithuania – The Second Stage of Land Reform

Over the past twenty years, social and economic decline in rural areas has intensified in the Central and Eastern European countries. A precondition for the reversal of this decline is the implementation of new policies in relation to the fundamentals of land ownership and management. In addition to addressing the problems of land ownership fragmentation, these should include measures to improve agricultural production and employment, taxation policy, and legislation to protect land ownership rights, within the context of acknowledging environmental and sustainability considerations. In Europe, the requirement for readjusting unfavourable land fragmentation and promoting the appropriate use of land combining with positive environmental solutions is expected to create new sustainable land management systems. The consolidation of land ownerships may be an effective and active land management instrument which not only addresses the problems of land fragmentation, but also, if applied sensitively, may be an instrument for delivering sustainable rural development in a wider context (Pašakarnis, Malienė 2010).

Land consolidation may be described as the planned readjustment of the pattern of the ownership of land parcels with the aim of forming larger and more rational land holdings. Other goals may be attached to the process of consolidation such as improvements to the infrastructure and the implementation of developmental and environmental policies (Pašakarnis, Malienė 2010).

Moreover, land consolidation projects are an excellent instrument to implement rural development projects which have and achieve multiple purposes and goals. For example, these projects will improve the agricultural structures (e.g. the reduction of fragmentation and enlargement of farm sizes), implement on nature through the environmental projects (e.g. according to EU Natura 2000- and Water framework directives), influence national and local infrastructure projects (e.g. new highways and railways, local rural roads and improved access to the revised landholdings) (Pašakarnis, Maliene 2010).

For many years land consolidation projects have been prepared not only in European but also in Asian countries. For instance, in China land consolidation

projects are being developed both in rural and urban areas, thus their designers and engineers can more effectively control their sustainable development (Gaudėšius 2011).

In England, the “Enclosure” movement gradually replaced the pre-existing atomised structure of agricultural land use over the period c.1500–1830. In Denmark the land consolidation program has roots more than two hundred years ago with the beginning of land reforms in the 1780s, when the common use of agricultural land was supplanted by forms of private ownership and a private family farms were established (Hartvigsen 2005, cited from Pašakarnis, Maliene 2010).

Modern land consolidation practices in Western Europe have been developed since the end of World War II, when notion of the equality between the rural and urban standard of living evolved all over Europe and there was a strong awareness of the importance of food security induced by wartime experiences. However, until the 1970s agricultural policies have focused mainly on the improvement of agricultural structures via reducing fragmentation and enlarging farm sizes (Weiss, Maliene 2004).

Twenty years ago, land consolidation in some Western European countries changed from being agricultural/farm-focused to being a tool to cover public demands for access to land and to resolve the resultant land use conflicts (Thomas 2004). A third impetus came from the EU regarding its cohesion policy within which land consolidation was promoted as an indispensable measure for integrated rural development (Thomas 2006 a, b).

In majority Western Europe countries, land consolidation is an integrated part of a broader rural development context (Weiss, Maliene 2004). In the EU member countries it is often implemented with EU co-financing under the national rural development programme (Pašakarnis, Maliene 2010).

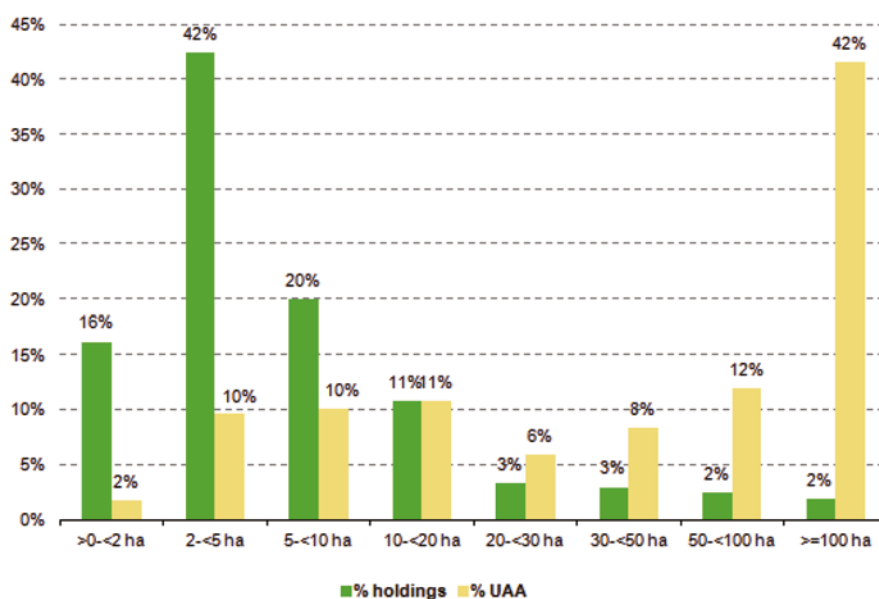
In Germany, for instance, a major challenge of land consolidation is building and updating of transportation networks. The Netherlands have focused on regulation of floods and updating of dam constructions. Thus, it is evident that goals of land consolidation can differ greatly and its strength improves urban and rural sustainable development (Hartvigsen 2005).

If all land consolidation opportunities were properly taken and fulfilled, villages would become attractive places to live and work in. The land consolidation process may create new jobs and build roads, improve the landscape, equip resorts, and all of which may significantly improve the quality of life in rural areas. It even might be one of the causes in reducing departure of young people from villages (Gaudėšius 2011).

Whereas Western European countries have long traditions and significant practical experience of land consolidation, Central and Eastern European countries presently stand at the beginning of this process. It is a complex process

which covers not only the technical aspects of the plan itself, but also the associated aspects of legislation, the establishment of the agencies to implement the plan, and, not least, the education of their staff (Thomas 2006 a, b).

In Lithuania land reform is essentially changing the land-use system of the country. Now more and more it can be perceived that even after the land reform the resultant land holding structure is inefficient because of its fragmentation, and that this situation has led to a rise in the number of abandoned plots. State land is also very scattered and spread chaotically, which in turn hampers its sale and its effective usage. There is also Free State land – land not privatized during the land reform which has been left to the State. Such plots are often of poor quality and therefore not very attractive. It is expected that Free State land will be privatized during land consolidation projects (Pašakarnis *et al.* 2013).



Source: Eurostat (2010)

Fig. 2.30. Number of holdings and utilised agriculture area (UAA) by UAA size classes in Lithuania, 2010

Moreover, former collective farms and large plots of land have been gradually changed into smaller ones. A result of this process has revealed various drawbacks: such as lack of roads leading to the land use, land-owner's land formed of several plots, small land areas, irregular land plots configuration. With the growing up competition in the market, it is difficult for small farms with small plots of land to compete not only with the European Union countries but in the local Lithuanian market as well (Gaudėšius 2011).

Lithuania's rural areas cover more than 97% of country's territory and are home to 33% of people (LIAE 2011b). In recent years, the average size of farms has slightly increased. According to newest available data from Eurostat, in 2010, the majority of the agricultural holdings (58%) were found to have less than 5 hectares of utilised agriculture area (UAA) in Lithuania (see Fig. 2.30). The farms whose UAA ranged from 2 ha to 4.9 ha were the most common, accounting for 42% of all the Lithuanian agricultural holdings. In terms of the agricultural area though, these farms accounted for a minor share: 12% of the UAA of the country. On the contrary, most of the UAA of Lithuania (54%) was found to belong to a small number of bigger farms (4%), i.e. those with 50 hectares or more of UAA.

Unfortunately, at the same time, the amount of abandoned land has increased from 400 to 900 thousands of hectares. This land is used neither as an economic nor as an agro environmental resource, which reduces the country's agricultural development, hinders the land resource management, undermines the country's image (Pašakarnis *et al.* 2013). Land consolidation is one of measures seen by Lithuanian government to form viable agricultural holdings (LIAE 2011a).

The first land consolidation experiences in Lithuania were from the Danish–Lithuanian bilateral land consolidation pilot project in the Dotnuva area (Kedainiai district) during September 2000 and January 2002. One of the main aims of this pilot land consolidation project was to create system for future land consolidation works (to be carried out in Lithuania) with reference to the practical experience obtained during the project. This system encompassed both legal and methodical provisions for the preparation of land consolidation projects (Daugalienė 2007). However, the main scope of this first project was narrowly focused on the improvement of the agricultural structure in the pilot area by enlarging farm sizes, reducing fragmentation and improving access to roads. A voluntary and market based approach was applied (Pašakarnis, Malienė 2010). Further three more projects were implemented (see Table 2.3).

Table 2.3. Main results of pilot projects on land consolidation in 2000–2003

District	Cadastral area	Total area, ha	Number of private land owners	Average parcel size, ha	Number of owners participating in the project	Land area, which changed owners, ha
Kedainiai	Dotnuva	392	79	4.4	19	86.0
Kedainiai	Akademija	662	57	10.0	21	122.0
Ukmerge	Pabaiskas	472	95	3.4	32	82.0
Marijampole	Puskelniai	350	58	4.8	10	22.0

It can be summarised that during the first consolidation project the total area was 392.0 hectares, 19 land owners agreed to participate in the project, the average parcel size of those who participated in the project was 4.4 ha. During the project, owners changed in 22% hectares of the land, 6 landowners sold their land parcels, 4 bought additional land parcels, 9 landowners exchanged their land parcels. The pilot project proved that it is possible to improve local agricultural structures with the help of land consolidation and to increase economic stability of family farms situated in the projected territory. The first pilot project on land consolidation provided people with knowledge on the practical preparation of such projects, problems arising during the process as well as on the necessity of legal acts regulating land consolidation (Kavaliauskiene, Tarvydiene 2011).

Continuing the first pilot project on land consolidation, new pilot projects „Land consolidation – an essential tool for the sustainable rural development” were started since October 2002. The first land consolidation project was prepared in the Akademija cadastral area (Kedainiai district), the project’s total area was 662 hectares. 21 land owner took part in the project. The average size of land parcel in the project’s territory was 10 ha. About 18% of the land changed the owner, the size of farm increased by 6 hectares and 14 hectares of free state-owned land was privatised (Gurskienė, Miknius 2005).

Since this territory is situated in very fertile soils, the main scope of this first project was the improvement of agricultural structures by enlarging farm sizes, reduction of fragmentation of land parcels, improved access to roads, building of new roads, arrangement of places for relaxation and rural tourism, afforestation for recreational purposes and repair works of land reclamation systems. Though the new roads and the reconstruction of land reclamation systems were designed, however, it was failed to get SAPARD financing for the implementation of rural development measures. It showed the imperfection of the financing mechanism for land consolidation projects (Kavaliauskiene, Tarvydiene 2011).

The second pilot land consolidation project was prepared in the Pabaiskas cadastral area (Ukmerge district). The project’s total area was 472 hectares. 32 land owners took part in the project. The average land parcel size in the project’s territory was 3.4 hectares. About 17% of the land changed the owner, 30 ha of free state-owned land was privatised (which obtained landowners living in that territory). The same problems as in the Akademija cadastral area occurred in the project – there was no financing for other rural development measures (road improvement and building) (Kavaliauskiene, Tarvydiene 2011).

The area of the pilot land consolidation project carried out in the Puskelniai cadastral area (Marijampole municipality) covered 350 ha, the average parcel area – 4.8 hectares, only 10 of 58 landowners took part in the project and 6% of the land changed owners. This land consolidation project is not a typical one, because the Via Baltica highway divides the territory of the project into

two parts. The main aim of this project was to improve agricultural structures, because the highway had partitioned land parcels. Fragmentary land holdings had formed, land parcels were small and irregular shaped. These factors were decreasing economic value of such parcels and impede land cultivation and usage (Aleknavičius 2009a).

Analysing early land consolidation projects one can notice that in the majority of projects some other measures (besides the land parcel readjustment) able to improve life quality as well as to increase productivity of lands and competitive ability of farms was foreseen. In the projects of Akademija and Pabaiskas cadastral areas it was foreseen to improve condition of roads, to build new ones, to arrange places for relaxation and rural tourism, to renovate drainage systems. Unfortunately, no financial means were allocated for the implementation of these measures; financial means were allocated only for the preparation of the projects. Some measures were implemented in the project of the Pabaiskas cadastral area: abandoned, unfertile land was left for the preservation of natural areas. It increased the recreational value of the territory, besides, some land owners decided to be engaged in rural tourism (Kavaliauskiene, Tarvydiene 2011).

Pilot land consolidation projects in Lithuania acknowledged people with the practical preparation of such projects, problems arising during that time and the necessity of legal acts regulating land consolidation (Kavaliauskiene, Tarvydiene 2011). Pilot projects estimated situation in Lithuania, showed specific features of country and required legal base for land consolidation. However, only 28% of land owners took participation in the pilot land consolidation projects (Aleknavičius 2009b).

Finally the land consolidation legislation was adopted in January 2004 by the parliament as part of the extensive amendment of the Land Law. The detailed provisions for implementation of land consolidation projects are regulated in a governmental resolution of June 2005 (Pašakarnis *et al.* 2013).

According to the Land Law of Republic of Lithuania (2004), land consolidation – a complex readjustment of land parcels when their boundaries and location are changed according to a land consolidation plan prepared for a certain territory, with an aim to enlarge land parcels, to form rational land holdings of farms and to improve their structure, to establish necessary infrastructure and to implement other goals and tasks of the agricultural and rural development as well as environment protection policy. The land consolidation projects can be implemented in the areas, where the restitution of land ownership rights is almost completed. In the rural areas where land reform is almost finished to start land consolidation process at least 5 land owners who together in total have not less than 100 hectares can provide application to the county governor.

In 2005 Lithuania has introduced a national land consolidation program with country-wide land consolidation projects co-financed under the EU Rural

Development program. Till May 1 2006, 14 applications were submitted concerning the execution of land consolidation projects. Financial support was allocated in 4 counties: Telsiai, Marijampole, Panevezys and Taurage. All 14 projects were finished on October 14, 2008. Main statistical data on the land consolidation projects carried out in Lithuania is presented in Table 2.4.

Table 2.4. Main results of projects on land consolidation in 2005–2008 (developed according to Kavaliauskiene and Tarvydiene 2011)

District	Cadastral area	The area of land consolidation project	Number of land owners and state-owned land trustees	Number or land parcels	
				Before the project	After the project
Telsiai county					
Telsiai	Degaiciai	670	44	115	67
Telsiai	Luoke	341	20	46	33
Mazeikiai	Zidikai and Ukrainai	638	55	111	81
Mazeikiai	Uzuzere and Plinksiai	362	29	52	40
Plunge	Sateikiai	136	11	23	17
Marijampole county					
Sakiai	Griskabudis	482	74	101	82
Vilkaviskis	Gizai and Keturvalakiai	607	31	57	41
Marijampole	Patasine	192	28	40	24
Taurage county					
Jurbarkas	Jurbarkai	208	14	38	10
Taurage	Zigaiciai	133	12	26	9
Panevezys county					
Kupiskis	Juodupenai	397	22	57	41
Kupiskis	Adomyne	270	18	26	17
Pasvalys	Ustukiai	192	21	31	39

Land consolidation projects were prepared in four counties and ten districts. These projects were prepared not only in different counties and districts, but in the territories of different areas as well. The largest territory covered 670

hectares (Degaiciai cadastral area, Telsiai district), the smallest territory covered 133 ha (Zigaiciai cadastral area, Taurage district). Different number of land owners took part in these projects. The smallest number of land owners (9) took part in the land consolidation project carried out in the Gizai cadastral area of Vilkaviskis district, the largest number of land owners (74) took part in the land consolidation project carried out in the Griskabudis cadastral area of Sakiai district. After the implementation of the project, compactness of parcels was improved and 8 land parcels were formed (Kavaliauskiene, Tarvydiene 2011).

Funding of these projects (their organisation, preparation and implementation) was covered under the Lithuanian Single Programming Document for the period of 2004–2006 (with support from The European Agricultural Guidance and Guarantee Fund Guidance section), under the IV priority “Rural development and fishery”, measure 4 “Promoting the adaptation of rural areas”, sub-measure “Land re-parcelling”. These 14 projects (further – LC projects) were financed by the European Union (71%), and from the National budget (29%). For the land owners this process was totally free of charge. Land consolidation projects are implemented only on voluntary basis in areas where the clarification of land ownership rights has been almost finished (~99% completed) (Pašakarnis *et al.* 2013).

Land owners from these first 14 projects presented common problems (identified through questionnaires) to the governors of the affected counties who then attempted to resolve them through land consolidation. Typically, this involved enlarging farm holdings, improving farm structure, compacting farms, improving the local road network, reducing distances between cultivated plots, creating a territorial base for infrastructure improvement, and identifying the areas where land improvements necessary (mainly repair of drainage) (Pašakarnis *et al.* 2013).

As the “owners” of the Free State Land (prior to July 2010 when their offices were abolished), the county governors were potentially able to resolve such problems through land consolidation and through a process of cadastral measurement which gave the plots within the “ownership” clearly defined boundaries. However, shortly after the consolidation started, it became apparent that the law would not allow for State Land to be involved in the process (Pašakarnis *et al.* 2013).

For this reason these first land consolidation projects fell far short of the initial ambitions for them. In the main, the projects were focused only on how to enlarge farm holdings and create a convenient local road network (which has yet to be started). The National Land Service under the Ministry of Agriculture affirmed that after the implementation of the land consolidation project, land owners and the local community would have priority in receiving external funding from other structural EU funds in order to fulfil planned improvements, i.e.

renovation of drainage systems, building of local road networks, etc. At the moment the situation with the local (field) roads is critical as farmers are driving with no regard to neighbouring boundaries even though the road network is set out in the land reform plans (Pašakarnis, Maliene 2011) (Pašakarnis *et al.* 2013).

Totally in all land consolidation projects the number of land plots reduced by 30% from 731 to 512. Accomplished multiple regression analysis by Aleknavičius (2009b) showed that both area of project and number of land plots have a great impact on costs of land consolidation projects (correlation coefficient $R = 0.86$). The analysis showed that there is a great demand for other rural development means. However cost of project implementation can be twice higher by implementing these means.

Soon after implementing these first 14 LC projects, problems in governmental sector were identified. Strong governance is still missing in Lithuania. The National Land Service (NLS) under the Ministry of Agriculture is doing a lot to promote land management processes through LC and is trying to fill in a huge information gap that is still a major reason for LC being slackly implemented. Many politicians are also not in favour of LC as they think that this land management instrument is destroying family farms and creating huge agricultural enterprises with the accompanying spectre of rich foreign farmers buying out the newly created freeholds. There are further reservations concerning the transparency of the transfer of State land into the private sector during the course of a LC project (Pašakarnis *et al.* 2013).

Within Lithuania there is still a lack of land management expertise and the older generations are still affected by the memory of the Soviet regime when collective farms were the model for agriculture. That is why the idea persists that land consolidation is going to create large collective style farms again (Pašakarnis *et al.* 2013).

The implementation stage of these projects covered only the preparation of land consolidation project plans and cadastral measurements. That is why there are presently no successful projects with all measures of sustainability fulfilled which could be presented as an example to parties interested in future project initiation. The initiation of new land consolidation projects was suspended as it became clear that many changes were required to bring forward legislation to establish a State Land Fund whose main priority was to be a strong and active player in the LC process (Pašakarnis *et al.* 2013).

On 12 August 2010 these changes were made and the State Land Fund was established reorganizing the main land reform actor – the State Land Survey Institute. The consolidation projects undertaken during Rural Development Programme (RDP) period of 2007–2013 were initiated by this entity.

After the evaluation of the experience of foreign countries, pilot and first land consolidation projects, the National Land Consolidation Strategy was prepared

during the fulfilment of the project “Support to the preparation of an operational land consolidation system in Lithuania” (Food and Agriculture Organization of the United Nations (FAO)) and was approved by the decision of the Government of the Republic of Lithuania on January 23, 2008. The main aim of the strategy – to create preconditions and foresee measures for the successful land consolidation ensuring the rational land use in rural inhabited localities, at the same time solving demands of the state, society and separate citizens in an integrated way (Kavaliauskiene, Tarvydiene 2011).

The implementation of this aim is foreseen through the safeguarding of the connections of land consolidation with rural and regional development as well as through the optimisation of the land consolidation process itself.

The duration of the implementation of the strategy is period of 2008–2027. In 2015 the intermediate assessment of the strategy according to the set assessment criteria will be carried out. The strategy implementation measures as well as financing sources will be revised.

The object of the National Land Consolidation Strategy (2008) is the rural inhabited areas of the Lithuanian territory, except small towns. After the evaluation of the composition of the land fund of the Republic of Lithuania, the land area used for agricultural production, the size of farms and the areas of protected recreational and suburban territories, the land consolidation should be gradually carried out in the area of about 900,000 ha.

The national land consolidation strategy has embedded the land consolidation instrument in the overall land policy of the country and has since guided the development of the land consolidation instrument.

In 2011, 23 new projects started and an additional 16 projects began in 2013, all funded under the “Regional Development Programme” (RDP) for 2007–2013.¹⁸³ The available budget for land consolidation under the RDP was EUR 16.16 million. Of this, EUR 5 million was allocated for the 23 projects of 2011 and EUR 5.5 million for projects of 2013, for a total of EUR 10.5 million (Leimontaite 2013). The first of these projects were being finalized in the summer of 2014 and all projects should be completed by mid-2015. The total approved project area in the 39 on-going projects is about 48,000 ha and the number of expected participating landowners is around 5,800 (Augutiene 2014).

It is expected that around 400,000 ha of state land will remain unprivatized after the complete finalization of the land reform process. Also Lithuania has introduced a license system for land consolidation works and, by 2014, 114 experts had been licensed.

Detail analysis of land consolidation results in Central and Eastern Europe was performed by Food and Agriculture Organization of the United Nations (FAO) (2015). The study divides the region into three categories: 1) where there are ongoing land consolidation programmes; 2) where land consolidation has

been introduced but there are not yet programmes; and 3) where there is little or no experience with land consolidation (see Table 2.5). Lithuania falls within the first category.

Table 2.5. Initial categorization of Central and Eastern Europe according to the experience with land consolidation (created according to FAO 2015)

On-going land consolidation programmes	Introduction of land consolidation but not yet a programme	Little or no land consolidation experience
Poland Czech Republic Slovakia Eastern Germany Slovenia Lithuania	Estonia Latvia Hungary Romania Bulgaria Serbia Croatia FYR of Macedonia Kosovo Bosnia and Herzegovina Albania Moldova Armenia	Montenegro Georgia Azerbaijan Russian Federation Ukraine Belarus

The analysis performed by FAO (2015) shows that there appears to be a clear linkage between the land consolidation approach applied in the seven countries and the historical circumstances under which land consolidation was introduced in the countries. In Poland, Slovenia and Serbia, following the Second World War, land consolidation was inspired by the German land consolidation tradition with a compulsory approach and integration with large-scale agricultural development. Serbia is using exclusively the compulsory approach although it has experimented with a voluntary approach at the level of pilots.

These three countries have struggled with what was often perceived by the rural population as bad experiences of the pre-1989 land consolidation programme. In Eastern Germany, land consolidation was re-introduced after the reunification with extensive technical assistance from land consolidation experts in Western Germany. In the Czech Republic and Slovakia, land consolidation was started from the beginning in the early 1990s. There were no donor-funded land consolidation projects but technical assistance was provided through cooperation with land consolidation authorities in Germany (mainly Bavaria) and Austria and the land consolidation instruments in these two countries are today strongly inspired by the German model (FAO 2015).

In Lithuania, land consolidation was introduced mainly with technical assistance from Danish land consolidation experts where land consolidation is

implemented in a voluntary approach. Danish land consolidation projects are being implemented on a voluntary participation of farmers. When the land consolidation project encompasses the area for construction of a new public road or any other state facility (e.g. planting the forest, taking the land for the environmental policy objectives, etc.), in the absence of a goodwill agreement of the land farmer, land can be taken by way of compensation under a special law. Each year in Denmark about 20 land consolidation projects involving about 50 land owners are undertaken (Daugalienė 2007).

The experiences of the seven countries show that it may not necessarily have to be a lengthy process to develop operational land consolidation programmes even with no prior experience in land consolidation. The Czech Republic and Slovakia managed to have operational land consolidation programmes after a few years of preparation in the early 1990s and Lithuania took less than six years to go from the initiation of the first very small pilot project in 2000, through a second round of pilots and the adoption of legal framework, to the beginning of the first projects under the national programme in 2006. The experiences show, however, also that everything does not run perfectly from day one and adjustments of the legal framework and procedures can be expected to be necessary after a few years of gaining field experiences. Thus, Lithuania amended the legislation and procedures in 2010 and Serbia is expected to do the same as an outcome of the on-going GIZ project. The countries that do not yet have a land consolidation programme could certainly learn from these experiences (FAO 2015).

It is interesting to see that in all seven countries with land consolidation programmes, the Ministry of Agriculture is the responsible lead agency for land consolidation and that the land consolidation instruments are embedded in the land policy of the countries, mainly through the rural development strategies and programmes.

In all six countries with a compulsory land consolidation approach, the participants in principle receive land of the same value as the land with which they joined the re-allotment planning. In Poland, a difference of within + three per cent is accepted. The outcome of the projects is the consolidation of the parcels for each owner but the total number of owners remains basically the same. This means that the potential to use the land consolidation instruments to facilitate structural development for the agricultural holdings involved in commercial farming is not reached (FAO 2015).

Landowners and farmers interested in purchasing additional agricultural land and increasing the size of agricultural holdings are required to separately buy land parcels from private owners willing to sell at local land market conditions as sale and purchase between the participants are usually not facilitated by the land consolidation professionals managing the projects.

In most Central and Eastern European countries the structural problems in agriculture are both land fragmentation and small agricultural holding and farm sizes. Land consolidation instruments in Poland, Slovenia, Czech Republic, Slovakia and Serbia have a future potential for also addressing the size problem. In Lithuania, selling and buying are facilitated in the land consolidation process and the enlargement of holdings and farms is an objective pursued through the projects (FAO 2015).

The seven countries with on-going land consolidation programmes all have a considerable amount of state agricultural land after they finalized their land reform. This land stock is usually managed by state land funds, which were often established in the early 1990s as part of the land reform process. In Slovenia, around 9% of the total agricultural land is possessed by the state land fund. In Slovakia, the same figure is 7% plus as much as 23% of the total agricultural land with unknown ownership, which is also managed by the state land fund. In Lithuania, it is expected that 400,000 ha will remain in state ownership after complete finalization of land restitution (FAO 2015).

The study shows that none of the seven countries use the available state land as a revolving state land bank in connection with land consolidation instruments as is the case in Western European countries, e.g. Netherlands, Germany and Denmark. Instead, state land represented by the state land fund participates in the land consolidation projects almost like the private landowners and, as an outcome of the project, the state land is also consolidated in fewer parcels. The availability of agricultural land from a state land bank is especially important in land consolidation projects with a voluntary approach and where land consolidation is applied together with projects requiring public areas (e.g. for infrastructure or nature restoration) where Land consolidation and land banking in Central and Eastern Europe after 1989 landowners are compensated with other land, because it increases the land mobility in the projects and thus increases the chances for successful implementation (Hartvigsen 2014).

3. HOUSING MARKETS: SUSTAINABILITY ISSUES AND CRISIS MANAGEMENT

3.1. Understanding of Housing Markets

Discussions about housing markets appear daily in the media and press of most countries and they underpin along with individuals' experiences. Different, more technical and more evidence rich debates about housing market outcomes are commonplace in municipalities, planning departments and the law courts. Diverse analytical perspectives, with equally varied empirical content and approaches, on housing markets are recurrently unfolded in the academic journals of core disciplines and, more commonly, specialist housing and urban journals (MacLennan 2012).

The housing markets as an area of interest is hardly surprising given both the causes and consequences of the recent Great Financial Crash (GFC).

In order to understand how housing markets work, at first it is important to define main terms of "housing" and "house". The Oxford Dictionary defines the word "house" simply as "building for human habitation". "Housing" is both a noun and a verb. The term is applied both to dwellings (my house, town house, council house, etc.) and the set of actions which (*inter alia*) plans, produces, finances, allocates and maintains dwellings. Both of these notions – "housing" (as noun and verb) need to be explored. This arises because the nature of housing as a commodity has direct, unavoidable, implications for the ways in which effective market exchange arrangements may operate. Making these systems work involves process (MacLennan 2012).

How we define housing will have implications for how we define and identify housing markets. Sociologists, anthropologists and economists have all explored the meaning of the words "home", "dwelling" and "house". Within more economically oriented literature there has been long emphasis on the product variety, spatial fixity, neighbourhood and asset aspects of housing (Quigley 2003).

It is useful, from time to time, to look at the variety of these approaches across disciplines, as it is a reminder of how reductionist we are within each discipline. If we wish to connect housing market analyses to broader concerns about well-being, psychological and material, or to consider how housing is embedded in complex social relationships, then a regular revisit to where we start as disciplinary reductionists is useful. The focus below is more narrowly on economic notions of the market (MacLennan 2012).

From an economic perspective, a house (or "housing") consists of a designed physical structure of connected and sheltered spaces and systems, constructed

of materials and components (pipes, wires, etc.) through the use of capital (e.g. developers' ingenuity and equipment), labour (from designers to bricklayers) and land or existing property. That is, houses are complex, durable, locationally fixed structures with multiple attributes that are invariably purchased and consumed jointly with the neighbourhood characteristics that surround them. This concept, broadly speaking, has been at the heart of housing economics for four decades or more and they are important features that make housing different from simple goods (MacLennan 2012).

There are some more specific housing market characteristics to be discussed (see Fig. 3.1).



Fig. 3.1. Characteristics of housing markets

Complexity. Economics research has been good at establishing the existence of the complexity of housing as a good. For almost four decades hedonic house price studies have been used to identify the economic significance of different, distinctive attributes of housing. These studies, that almost invariably have high levels of explanatory power, confirm that housing prices are influenced by attributes or characteristics such as (MacLennan 2012; Galiniene 2015; Raslanas 2004):

- Size, style, layout and internal amenity (variety);
- The location of the dwelling: households pay not just for size, type, quality but for the characteristics of the location; these (place and space) influences include:
 - the costs of accessibility to the wider spread of locations used by household such as employment, shopping and leisure locations;

- the quality and availability of neighbourhood amenity, including neighbours;
- access to local retail and service facilities (both public and private);
- The asset importance of their home and possibilities for (relative) gain and loss as well as quality and maintenance obligations (fixity and durability).

The range of attributes involved can be grouped under the three broad headings of product variety, place and space, and fixity and durability.

Product variety. The real and diverse characteristics of housing have a number of implications for market structures and processes (Quigley 2003). The first characteristic is that the range of significant elements of household well-being, or utility, influenced by housing characteristics, is such that the costs associated with the house will always be a significant element of households' budgets, so that mistakes matter. The second characteristic is that the costs of search and exchange (where dwellings are bought and sold rather than rented), allied to their budget significance, means that residential moves and therefore well-informed trading by individual consumers, are relatively infrequent.

With so many complex characteristics, this means that households, to avoid difficulties of adverse selection and moral hazard, are likely to deploy market experts to inform price bids. This is likely to mean that not only do mistakes matter, but also that with positive transaction costs they may be expensive to reverse (MacLennan 2012).

Sellers will have an interest to conceal information in some instances and there may be significant information asymmetries about issues such as true dwelling condition (the central heating defects that you only know when you live in a house) and the nature of some externalities (the atmosphere of a neighbourhood, the propensity to form or avoid informal contacts, etc.). In some jurisdictions there are regulations requiring sellers to disclose relevant property information but even where they do exist there are potential neighbourhood effects that will be customer- as well as property-dependent (MacLennan 2012).

Attribute complexity, in the case of housing, invariably leads to the need for agents and institutions. Their views can matter in shaping the choice sets that households can make effective. The question then arises as to whether the information and agent structure operating within the market is competitive or influences choices made and prices set in particular times and places.

Consumer assessment of the quality and implicit price of a diverse set of housing attributes is clearly a demanding information-processing exercise if strict neoclassical behaviours are assumed. This remains the case even where consumers have assessment procedures that are hierarchical or that eliminate by aspects (MacLennan 2012).

The nature of housing attributes, given the complexity of design and attribute interactions, is such that they often have to be physically seen by buyers to be truly valued. There are important exceptions to this. For example, in some larger nations such as the USA, Canada and Australia, where interregional distances are on a grand scale, some households are prepared to rent and buy homes without visits but on the basis of an expert assessment associated with an electronic virtual tour. And in the UK there have been significant instances in the last decade of London-based buy-to-let investors purchasing properties in northern British cities without visiting them. In the first of these instances, the significant housing search costs involved explain unseen choice, and in the second case the detailed arrangement of the attributes were unimportant as the purchase had no consumption dimensions for the purchaser. More complex households, with multiple consumption uses of the dwelling, will usually be anxious to search homes and neighbourhoods prior to purchase.

Search costs are likely to be significant, especially in “hotter” housing markets, and they are also likely to be significant because of the spatial nature of housing markets (Novy-Marx 2009; Piazzesi, Schneider 2009).

Place and space, fixity and durability. Space effects interact with variety and durability in shaping the functioning of housing markets. First, space and place (geography) matters because households are choosing places, neighbourhoods and locations when they choose their home. Home and neighbourhood is an ineluctably conjoined choice. This jointness not only adds to the variety of attributes that have to be considered but also adds other distinctive aspects to housing choice that are considered below (MacLennan 2012).

Secondly, unless we are living in a world of tents and mobile homes, space matters in market functioning because properties cannot be brought feasibly to some central market place. Purchasers have to search the spatially dispersed sales sites and know which sites to search (Clark 2005). Aside from the search costs involved, there is a further, important market functioning consequence. Searchers, agents and institutions will not in reality be selecting or selling across a fully connected or centralised set of possibilities. Rather, searchers for immobile sales offers will have to choose within a (probably) localised set of a limited number of options. Preferences and information flows, and expert advice, will mean that the housing market in, say, a city at some point in time is not a single market but rather a collection of relatively localised exchanges. To assume that searchers, sellers or agents can equilibrate the price/quality relationships for the whole set of properties traded at any immediate time is an onerous demand to place on the market mechanism (MacLennan 2012).

A metropolitan housing system may have multiple localised simultaneous trades but this does not necessarily mean that the market will be singular in its price outcomes and perfectly competitive in its structures. Spatial search and

informed choice, and the potential roles of market experts and institutions, are likely to be given even greater salience by the interaction of locational and fixity characteristics of dwellings (MacLennan 2012).

A further crucial consideration is that a house, when built, also has an *absolutely fixed location*. Although houses are spatially fixed, the geographies of employment, social composition, crime, etc., around about them might change (homes are absolutely fixed but their relative location might change over time) (MacLennan 2012; Galinienè 2015).

This absolute fixity of a dwelling, combined with its durability in a potential matrix of changing locational attributes, means that owners face risks of price depreciation (appreciation) and asset losses (gains) that lie beyond their own control. Purchasers require information about options and risks, and this reinforces the roles that “expert views” (surveyors, estate agents, lawyers and lenders) may have in choices (MacLennan 2012; Brett, Schitz 2009).

Geography and time interact to make consumer and expert expectations about prices and areas an important feature of how housing systems operate.

A further problem for smooth equilibrating tendencies in housing markets is that an important attribute of housing choices, often associated with neighbourhood attributes, is that they are often a “social situational good” (MacLennan 2012).

There is clear evidence that for many, though not all, households that individuals choose houses where they wish to live amongst people like themselves. That is, neighbours are an important determinant of neighbourhood quality so that households are extensively interdependent in their decisions (MacLennan 2012).

In brief, the key features of housing are likely to mean that in some neighbourhoods, and particularly those regarded as problematic for policy, change patterns may be complex/chaotic rather than smoothly adjusting. Fast, non-linear demand responses may play out in a context of rather slow supply-side responses and where non-price adjustments have key roles in shaping equilibrium. This brings us to issues of change rather than choice (given some fixed set of housing opportunities) and moves into the medium and long term.

It is important to ask why supply-side responses are typically sluggish, not least because in the absence of that reflection too many polemicists and more than a few economists lay supply inelasticity at the door of planning system constraints (MacLennan 2012).

The construction industry is fragmented, often, productivity gains are slow and much of the return to construction (in some countries) is made from land-holding. There may be localised monopolies of land hoarding. Lagged information and incomplete adjustments prevail. The market may be far from perfection, but still in some ways competitive. And in that context the challenge for applied

analysis is to identify the balance of “market” failures versus planning restrictions (MacLennan 2012).

Finally, it is important to note, that there are many situations in which a residential market analysis is necessary and useful in guiding decisions by developers, lenders, investors, and public sector agencies. For example, a market study may be needed to (Brett, Schitz 2009):

- Identify residential development opportunities;
- Provide input for site planning, building and unit design, or financial analysis;
- Conduct a due diligence review for loan application, acquisition, or equity investment, or in support of a grant application made to a public sector agency;
- Monitor the performance of a completed project relative to its competition;
- Reposition an asset that is not performing up to expectations;
- Guide public sector housing policy and its effects on land use plans and restrictions, or even real estate crisis management.

Over the last decade there has been a renewed interest in the role of “the housing market” in the national economy. The long boom, from the early 1990s to 2007 and the subsequent GFC in the USA, have all featured housing prices, wealth and equity withdrawal as key elements of instability. In consequence, for the vast majority of economists the phrase “housing market” connotes not an interest *per se* in the real functioning of housing markets but how the incorporation of macro housing outcomes, such as price changes and aggregate shifts in housing debts and equity, changes the forecasts of macro models (MacLennan 2012).

Macroeconomic models or assessments involving housing have typically been concerned, as in recent fiscal stimulus programmes, with the multiplier effects of housing investment or with the role of housing markets in economic cycles. There has been a resolute disregard of how housing market outcomes influence national productivity, growth and competitiveness.

Glaeser (2009) has recently argued that “the wealth of cities” is influenced by labour migration and that to understand metropolitan growth there has to be a focus beyond wage rates to a wider “net advantages” perspective. In that broader view, Glaeser (2009) emphasises how housing costs and varieties can influence labour market outcomes, human capital and city growth. But there is a broad range of housing outcomes, affecting existing as well as mobile households, that could conceivably impact human capital, and business investment decisions too (see MacLennan 2008). Housing research and housing policy has much work to do in confirming that often locally argued benefits of good housing outcomes can have productivity and growth effects (MacLennan 2012).

Setting housing in the context of a macro modelling framework has some important virtues. The drivers of demand and supply, such as incomes, taxes

and interest rates, can be linked to national housing outcomes. If anything, such analysis also draws attention to the major markets of functions connected to the business of constructing, financing and selling housing: what was labelled above as “housing the verb”. These housing activities then have strong connections to labour, capital, land and materials markets (MacLennan 2012).

Housing market forces – supply and demand – are discussed in detail in the next Section.

3.2. Supply and Demand of Housing. Affecting Factors

The determination of prices in local and regional housing markets is a classic example of microeconomics in action (Riley 2015). It is the interaction between buyer and seller with prices being offered and agreed before a final transaction is made.

Each housing transaction depends on (Riley 2015):

- The price that the seller is willing to agree for their property with the prospective buyer;
- The actual price that the buyer is willing and able to pay.
- Buyers place offers for a property that the seller can either accept or reject.

A Sellers’ Market. When the market demand for properties in a particular area is high and when there is a shortage of good quality properties (i.e. supply is scarce) then the balance of power in the market shifts towards the seller (see Fig. 3.2). This is because there is likely to be excess demand in the market for good properties. Sellers can wait for offers on their property to reach (or exceed) their minimum selling price (Riley 2015).

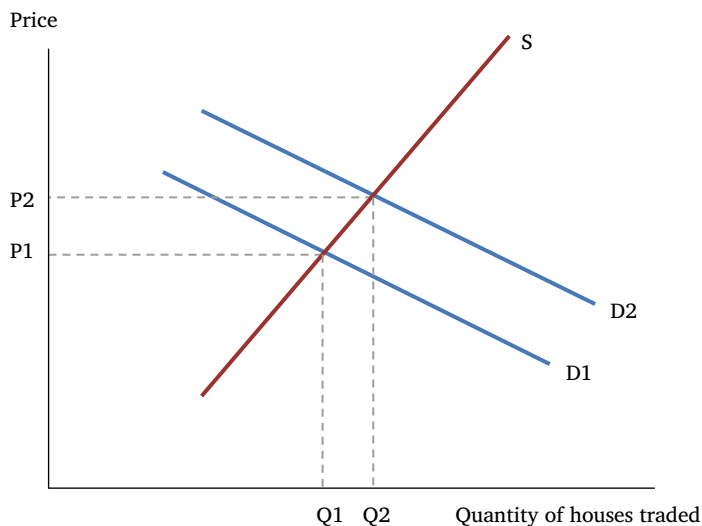


Fig. 3.2. Shifts of demand for housing

A Buyers' Market. Conversely when demand both for new and older housing is weak and when there are a lot of properties available on the market, then the power switches to potential buyers. They have a much wider choice of housing available and they should be able to negotiate a price that is lower than the published price (Riley 2015) (Fig. 3.3).

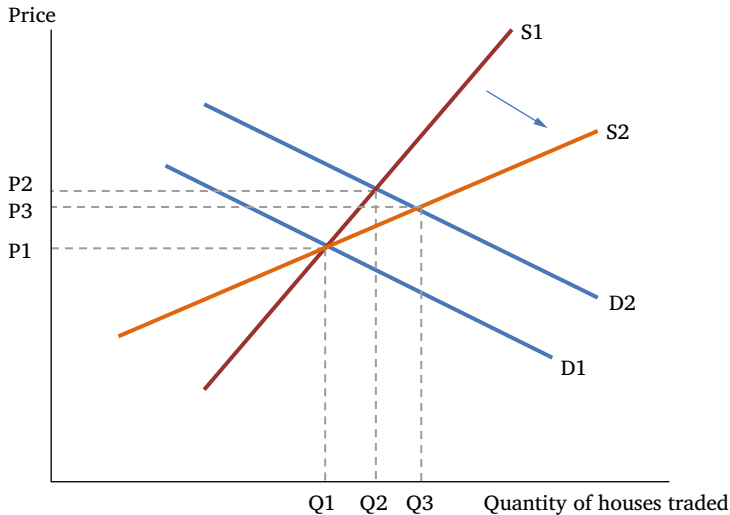


Fig. 3.3. Shifts of supply for housing

When the demand for houses in a particular area increases (i.e. because of an inflow of population into the area, or a rise in incomes following a fall in unemployment), there is upward pressure on market prices.

Often the supply of available housing in the market is relatively inelastic. This is because there are time lags between a change in price and an increase in the supply of new properties becoming available, or other homeowners deciding to put their properties onto the market (Riley 2015).

Housing supply is subject to several types of project delays (Banaitienė *et al.* 2012; Gudienė *et al.* 2013). On average, it takes 6 months to get approved for a residential building permit and another 2–4 quarters to complete a construction project (Bahadır, Mykhaylova 2014). According to Gyourko *et al.* (2008), it takes on average 6 months to secure authorization for a new project. Once the construction permit is issued, the average length of time from start to completion of new privately owned residential buildings varies from 6 months for one-unit buildings to 12 months for two or more units.

Bahadır and Mykhaylova (2014) presented a two-sector model that incorporates these observations and show that the effect of these delays is not uniform: while they amplify the response of house prices to demand shocks, they dampen the effects of housing supply shocks. Moreover, construction activity depends on

the relative duration of the shocks and the construction delays: delays dampen construction booms following temporary shocks, but exaggerate building activity following permanent changes in demand or supply conditions. Results of authors' research highlight the importance of capturing the nature and the persistence of the shocks when studying the effects of construction sector delays on housing market dynamics.

Most residential homes are built based on the expectation that a buyer will be found following the project commencement or even after the unit is built (so called "on spec" construction), thus causing construction companies to take on the risk of real estate investment.

Because construction activity must be forward-looking, and also because building costs tend to be "front-loaded", – with returns achieved only after the costs have been sunk, the combined effect of these delays on the housing market dynamics is non-trivial (Bahadir, Mykhaylova 2014).

Several recent papers have pointed out that various construction delays can significantly lower the responsiveness of housing supply to economic disturbances and thereby amplify the magnitude of house price fluctuations.

On the empirical side, Quigley and Raphael (2005), Ihlanfeldt (2007), Glaeser and Ward (2009), Huang and Tang (2012) examined the importance of regulatory constraints, which range from financial fees to zoning restrictions to delays in the approval process, for the housing supply elasticity.

Among theoretical and structural estimation models, Mayer and Somerville (2000) found that development fees have relatively little impact on new construction, but regulations that lengthen or otherwise constrain the development process have significant effects on housing starts.

Paciorek (2013) reports that construction lags and marginal costs play critical and complementary roles in distorting the elasticity of housing supply and in amplifying housing market volatility. Glaeser *et al.* (2008) present a simple model of housing bubbles which predicts that localities with more elastic housing supply have fewer and shorter bubbles with smaller price increases. Malpezzi and Wachter (2005) offer theoretical support for the importance of supply sluggishness in explaining boom and bust cycles in housing markets.

However, Davis and Heathcote (2005) and Iacoviello and Neri (2010) provide evidence that fluctuations in residential investment and house prices can also be driven by supply shocks in the housing market. For instance, between 1974 and 2007 the USA has experienced three distinct episodes of significant negative correlation between housing prices and investment, suggesting that the housing market was driven primarily by supply side factors. This evidence motivates a more careful distinction between supply and demand shocks in studying the implications of construction sector delays on housing market dynamics (Bahadir, Mykhaylova 2014).

Although frequently overlooked, housing supply shocks are important drivers of housing market fluctuations. Davis and Heathcote (2005) underline the importance of supply side disturbances in understanding the volatility of residential investment. The authors demonstrate that reduced-form regressions of residential investment on house prices and the real interest rate, which often serve as evidence of a demand-driven residential investment, may suffer from a misspecification bias relative to the structural equilibrium relationship implied by the model developed in their paper. They further argue that this misspecification bias may be quite large, and thus challenge the empirical claim that fluctuations in residential investment are primarily driven by changes in demand.

Iacoviello and Neri (2010) also focus on the sources and consequences of fluctuations in the USA housing market. Their findings suggest that, over the business cycle, construction technology shocks explain 30% of the residential investment volatility and 20% of the volatility in housing price.

Cardarelli *et al.* (2009) quantify the role of the housing sector in the business cycles of advanced countries. The authors identify housing demand and supply shocks in a standard monetary vector autoregression (VAR) model augmented with a housing sector. They show that, in a typical OECD economy, the effects of housing demand and housing supply shocks on short-term residential investment variability are large and of comparable magnitude.

Despite these observations, most recent papers in the literature study the housing market in the context where housing demand shocks dominate the model dynamics. For example, by analysis of 1975–2008 data, Paciorek (2013) shows that there is a strong positive correlation between regional housing price volatility and the level of regulatory constraints. This observation can be interpreted as *prima facie* evidence that over the last three decades the housing market has been dominated by demand shocks, since the correlation would be negative if housing supply shocks were systematically more important.

When demand shifts outwards and supply is inelastic the result is a large rise in market price and a relatively small expansion of the quantity of houses traded. As supply becomes more elastic over time, assuming the conditions of demand remain unchanged, it is expected to see downward pressure on prices and a further increase in the equilibrium quantity of houses bought and sold (Riley 2015).

The market for owner-occupied housing is sensitive to changes in market demand and supply. The strength of these factors often explains disparities in house price inflation between and within the major regions. Demand conditions for housing influence both the willingness and ability of people to make house purchases. Some of the most important conditions of demand are listed below.

Growth of real incomes – privately owned housing is a normal good for most people. As average living standards rise, the total demand for housing expands,

as does the demand for more expensive properties as people look to move “up market” (Riley 2015).

Engsted and Pedersen (2015) conducted a comprehensive international study of predictability in housing markets using the rent-price ratio as a predictive variable. On data from 18 OECD countries they generally find return predictability in accordance with time-varying risk-premia, but they also document two puzzles. First, there is a highly unstable predictive pattern in rent growth across countries and time periods. Second, the predictive patterns are highly dependent on whether housing returns and rents are measured in nominal or real terms. These results are difficult to reconcile with fully rational expectations. Among other things, the results indicate that housing markets in many countries suffer from money illusion.

Standard textbook models of price determination in housing markets imply that rents are a fundamental determinant of housing value, similar to the role of dividends in determining equity valuations in stock markets, and the rent-price ratio (sometimes denoted the “cap rate”) summarises market expectations of future housing returns and/or rent growth in the same way as the dividend price ratio summarizes expectations of future stock returns and/or dividend growth. A number of recent studies have analysed the predictive power of the rent-price ratio for future returns and rent growth in the USA housing market (e.g. Gallin 2008; Plazzi *et al.* 2010; Cochrane 2011). The overall finding is that the rent-price ratio predicts future returns more strongly than it predicts future rent growth, just as the dividend-price ratio appears to be a stronger predictor of returns than dividend growth in the USA stock market (Cochrane 2011).

Whether the rent-price ratio predicts future returns or rent growth is of fundamental importance for the interpretation of price movements in housing markets. The dramatic increase in US house prices up to 2006 (followed by a severe drop) must be due to one of the following three causes (or a combination of them). Either a speculative bubble, changing expectations of future returns (e.g. due to changing risk premium), or changing expectations of future fundamentals. The empirical evidence cited above points to the second of these causes as the most important, although Shiller (2005) argues that an irrational bubble was the main driver, while Himmelberg *et al.* (2005) on the other hand argue that the price increases were caused by “strong” fundamentals.

Aforementioned studies in this area have focused on the US housing market. Very little is known about the rent-price ratio’s predictive power for housing returns and rents in other countries. Many other countries have experienced similar house price movements as in the US, with dramatic increases up to around 2006 followed by a severe decrease. Thus, there is a clear international dimension to the movements we have seen in housing markets during the last 15–20 years (Engsted, Pedersen 2015).

The main findings of analysis performed by Engsted and Pedersen (2015) in 18 OECD countries are as follows. First, there is a highly unstable predictive pattern in rent growth across countries and time periods. For one large group of countries an increase (decrease) in the rent-price ratio significantly predicts a decrease (increase) in rent growth, while for another large group there is significant predictability in the opposite direction. Furthermore, in sub-sample analyses the sign of the rent-price coefficient in rent growth regressions often changes between sub-periods. Second, the predictive patterns are highly dependent on whether housing returns and rents are measured in nominal or real terms. This is especially true for rent growth: for many countries nominal rent growth predictability with a positive sign is turned into real rent growth predictability with a negative sign. For returns this effect is not as pronounced but for a few countries negative nominal return predictability is turned into positive real return predictability.

The difference in nominal and real predictability is due to inflation being predictable by the rent-price ratio. For example, US inflation is negatively predictable by the rent-price ratio. The implication is that while nominal housing returns in the US are not predictable, real returns become positively predictable but this predictability is an artifact of inflation predictability. Similarly, US nominal rent growth is negatively predictable by the rent-price ratio while real rent growth is not predictable (Engsted, Pedersen 2015).

Consumer confidence – confidence is vital in the housing sector. If expectations for the future performance of the economy deteriorate and people become less optimistic about their own financial circumstances, they are tempted to curtail their search for a new home or delay entry into the owner-occupied sector (Riley 2015).

When the economy is enjoying sustained growth and rising prosperity – improved confidence raises the number of home buyers and shifts the balance of power in the market towards the seller if properties are in short supply (Riley 2015).

Kuang (2014) presented a model of housing and credit cycles featuring distorted beliefs and co-movement and mutual reinforcement between house price expectations and price developments via credit expansion/contraction. According to author, positive (negative) development in house prices fuels optimism (pessimism) and credit expansion (contraction), which in turn boost (dampen) housing demand and house prices and reinforce agents' optimism (pessimism).

Deriving house price forecasts from the future markets for the Case–Shiller house price index (where only the data from 2006 onwards are available), Gelain *et al.* (2013) find the co-movement and mutual reinforcement between agents' pessimistic price beliefs and price realizations during the house price reversal, in particular, “the future market tends to over predict future house prices when prices are falling” and persistent one-sided forecast errors.

Using a vector-autoregression (VAR) model and data from the University of Michigan Survey of Consumers, Lambertini *et al.* (2013) provide evidence on the importance of news and consumers' beliefs for housing-market dynamics and aggregate fluctuations. They document that innovations to News on Business Conditions generate hump-shaped responses in house prices and other macroeconomic variables. They also show that innovations to Expectations of Rising House Prices are particularly important in explaining the path of macroeconomic variables during housing booms. However, during housing booms, innovations to Expectations of Rising House Prices unrelated to News on Business Conditions account for a large part of macroeconomic fluctuations. Shocks to News and Expectations account together for more than half of the forecast error variance of house prices, and other macroeconomic variables, during periods of booms in house prices.

According to Case and Shiller (2003), expectations of future house-price increase played an important role in past periods of rising house prices in the USA. Piazzesi and Schneider (2009) find that the belief in rising house prices, as measured by the percentage of agents who believe that prices would rise further, increased during the last housing boom exactly when prices reached their historical highs. These authors also find that expectations of future house-price appreciation are related to optimism about economic conditions. Nofsinger (2002) argues that the emotions and psychological biases of households play an important role in the boom–bust cycle, with increased speculative behaviour late in an economic expansion and restricted economic behaviour in a contraction.

In the context of a three-variable VAR with real GDP, real consumption and survey data from the Michigan Survey, Barsky and Sims (2012) show that unexpected shifts in the responses to questions that measure consumers' confidence about future economic conditions have powerful predictive implications for the future paths of macroeconomic variables.

Jobs – because financing a house purchase involves making a long-term commitment through a mortgage lender, changes in unemployment levels exert a significant impact on housing demand. For example in areas when unemployment remains persistently above the national average, average incomes are likely to be lower and confidence among buyers will be negatively affected (Riley 2015).

On the basis of structural vector auto-regression (VAR) model and survey-data of unemployment-rate expectations, Leduc and Sill (2013) show that changes in expected future economic activity contribute significantly to current economic fluctuations.

The three factors, including incomes, employment and confidence are critical in determining the direction of house prices. When these three factors are rising the conditions are normally in place for sharp upward movements in prices (Riley 2015). However, other economic variables also are important.

Expectations of future price movements – is housing to be regarded as a consumer durable that provides a flow of services to the owner over a long period? Or should we think of a house purchase, as a major financial investment that we expect will provide us with substantial capital gains in the long run? The answer is probably a mix of the two. A number of recent research document over-optimistic expectations about the future path of house prices and the co-movement between the expectations and house price developments during the housing boom preceded the financial crisis. Cheng *et al.* (2013) studied personal home transaction data of the mid-level Wall Street managers in securitized finance both on the buy and sell side, which is supposed to reveal their beliefs about the path of house prices. They document that the securitization agents held over-optimistic beliefs about future house prices and call for serious considerations of the role of beliefs in the financial crisis and the macroeconomic implications of their belief dynamics. Case *et al.* (2012) document over-optimistic expectations of home buyers using the Case–Shiller home buyer survey implemented at four metropolitan areas of the USA. Based on the data from Michigan Survey of Consumers, Piazzesi and Schneider (2009) find that the “optimism” in the housing markets, i.e., the share of agents believing prices to increase further co-moved positively with the house price level and peaked exactly when house prices reached its peak.

Lithuanian housing sector boomed because of a strong speculative demand for properties in 2004–2007.

Changes to the system of housing taxes and subsidies – government policies affect the housing sector in different ways ranging from benefits for council taxpayers on low incomes to the payment of stamp duty on the most expensive properties (Riley 2015).

Market developments reflect the decisions of thousands of homeowners to offer their houses for sale and to set reservation prices that they are prepared to accept. At the same time, prospective homebuyers shop around for good deals. Given the search nature of the process, the market does not clear continuously and variations in the time on the market and the rate of sale may accommodate inertia in prices (de Wit *et al.* 2013).

3.3. Housing Market Performance Indicators

In 1993 the World Bank housing policy paper “Housing: Enabling Markets to Work” (WB 1993), used a series of housing market indicators collected in 53 cities around the world to support its arguments. According to WB (1993), housing market performance is measured by four attributes (see Fig. 3.4): the flow of investment and new production; the quality and quantity of the existing housing stock; the cost of housing; and its location.

In fact, most of these measures reflect in one way or the other the legacy of the system. Housing stocks change very slowly and the types of amenities, the number of units relative to population, the amount of space and a unit's location will generally be determined by past policies. The legacy of the past can affect the performance of housing markets in two ways (Buckley, Tsenkova 2012).

First, if the non-market regime that preceded the transition produced a shortage of housing, the reduction in output during the transition can cumulatively become more disruptive, particularly when the demand for housing is affected by demographic factors, which are less price-sensitive.

The second way that the legacy of the past can affect the transition is through the spatial distribution of housing. For example, in economies dominated exclusively by the principles of central planning, there is evidence that housing was located in highly non-optimal ways both within and across cities (Bertaud, Renaud 1997).



Fig. 3.4. Attributes of housing market performance

Housing investment and new housing production are the two most dynamic indicators of housing market performance. Over longer periods of time a flow of new housing is important to meet demographic, relocation and demand, as well as to offset depreciation. At the same time, cyclical reduction in this investment also represents a time-honoured channel through which an economy adjusts to recession. In Arthur Burns' words, real estate investments can "serve as the handmaiden of monetary policy", responding very elastically

to increases in interest rates. But, when recessions are prolonged, sustained reductions in production can have a cumulative impact on market adjustment and prices. Given the low production levels in many transition economies during the last decade, it appears likely that a large cut back in residential capital has occurred. This kind of situation can create recovery problems in a market-based economy, particularly when prices and incomes of the new economic system are often designed to encourage people to move and demand new housing (Buckley, Tsenkova 2012).

The quality and quantity of the housing stock. Two indicators can measure housing consumption at the national level: number of units per 1000 inhabitants and average space per person. Both indicators provide crude estimates of housing shortages and overcrowding. Housing quality is much more difficult to measure. Such indicators as share of housing stock that has water and systems, bathroom, central heating and kitchen/or kitchenette can be used as an indicator of housing quality (Buckley, Tsenkova 2012).

The cost of housing and affordability. The cost of housing represents the relative price of housing in the traditional microeconomic sense. However, it also is a proxy for the scale of macroeconomic disruption. For example, Hegedus *et al.* (1996) have shown that over time, as transition economies have stabilized, the cost of housing, standardized by household purchasing power, has fallen to OECD levels, whereas during the early years of reform and in less stabilized economies, it was often a multiple of that level. Not surprisingly, as economies adjusted and high inflation rates have been reduced or eliminated, median house price to income ratios have also declined. As discussed in Hegedus *et al.* (1996), this measure provides an indirect measure of affordability and functioning of the market with respect to costs.

The idea of affordable housing recognises the needs of households whose incomes are not sufficient to allow them to access appropriate housing in the market without assistance (Milligan *et al.* 2004). Thus, the term “affordable housing” describes housing that assists lower income households in obtaining and paying for appropriate housing without experiencing undue financial hardship (Milligan *et al.* 2004). A range of publicly or privately initiated forms of housing may meet this specification (Milligan *et al.* 2007). In fact, in recent years, the term “affordable housing” has been used as an alternative to terms such as “public”, “social” or “low cost” housing (Gabriel *et al.* 2005).

Conceptualising and measuring affordability is as complex as understanding the causal factors of the housing affordability problem itself. Indeed, as the discussion of affordability debates illustrates, many of the conceptual and measurement problems stem from contested understandings of the problem. For example, housing affordability can be understood as the continuing costs of a mortgage or rents relative to income, problems of accessing affordable housing

(e.g., first home ownership), not being able to afford housing costs after meeting other expenditures, or a problem of too low an income or too high housing prices. Even more problematically, affordability can be experienced by household types in different ways; that is, through the employment, transport, health, and other consumption trade-offs that have to be made by singles, sole parents and couples with children as they adapt their circumstances to high housing costs and/or low income (Gabriel *et al.* 2005; Urban Research Centre 2008).

Affordable housing is housing that is appropriate for the needs of a range of low to moderate income households and priced so that low and moderate incomes are able to meet their other essential basic living costs (Urban Research Centre 2008).

Gabriel *et al.* (2005) has pointed out that definitions usually focus on the relationship between housing expenditure and household income, typically to establish a standard in respect of which the amount of income spent on housing is deemed unaffordable. For example, traditionally, financial institutions have applied a rule of not allowing households to take out home loans requiring more than 30% of gross income for their servicing (Select Committee 2008; Urban Research Centre 2008).

Another concern with ratios and averages relates to income and wealth distribution. Typically “affordable” housing is defined as not being above a specified proportion of household expenditure, often now 30%. Even taking point-in-time comparisons at face value, critics of this approach argue that 30% of a low income may be less “affordable” than 40% of a high income because 60% out of a high income still leaves this household with an above-average disposable income (Paris 2007). Battellino (2008) reinforces the concern with the application of a single 30% ratio to all households, including those with very high levels of residual income and argues that the rise in real incomes since the early 1990s has substantially changed the basis on which the 30% benchmark was originally proposed. Households with high incomes can spend over that proportion on housing and still have plenty of money to spend on other things. It is not surprising, therefore, that some commentators who use a fixed benchmark for housing stress – such as housing repayments exceeding 30% of income – are finding that more and more households are exceeding the benchmark (Battellino 2008; Urban Research Centre 2008).

30/40 rule is still the preferred measure of housing stress; being households in the lowest 40% of the income distribution paying over 30% of income on housing. This benchmark – also sometimes called the “Ontario measure” – is also used internationally as a guide to eligibility for government assistance (Select Committee 2008). Gabriel *et al.* (2005) provides a rationale for continued use of the 30/40 affordability rule because it provides continuity with traditionally used measures and because it is simple to apply and easy to understand.

In general, comparing the relationship between housing expenditure (rent or mortgage) and household income is the most common way to define and express housing affordability internationally (Mulliner, Maliene 2015).

However, the concept of “affordability” is multi-dimensional and goes much wider than this traditional notion. Conceptualising and measuring affordability in this manner focuses only on financial attributes and fails to deal with wider social and environmental issues such as housing quality, location and access to services and facilities. OECD countries are increasingly recognising the need for a broader and more encompassing understanding of housing affordability along these lines (Gabriel *et al.* 2005; Fisher *et al.* 2009; Mulliner, Maliene 2015).

The questions on the concept of affordability were initially raised by re-searchers in the 1990s, both in the UK and the USA, who suggested that the meaning of the term needed to be clarified or its use should be discontinued (Hulchanski 1995; MacLennan, Williams 1990). Internationally, a number of authors provided their assumptions on definitions of affordable housing (see Table 3.1 for summary of definitions from the earliest research to nowadays).

Table 3.1. Assumptions on housing affordability definitions

Author	Definition
MacLennan and Williams (1990)	Affordability is concerned with securing some given standard of housing (or different standard) at a price or a rent which does not impose, in the eye of some third party (usually the government) an unreasonable burden on household incomes.
Malpass, Murie (1990)	Affordability is a virtually undefinable concept and certainly cannot be neatly or simply understood in terms of a fixed percentage of income to be spent on housing costs.
Hancock (1993)	Any rent will be affordable, which leaves the consumer with socially-acceptable standard of both housing and non-housing consumption after rent is paid.
Chaplin <i>et al.</i> (1994)	Definitions of affordability must clearly take account not only of the cost of housing, but of housing standards and the price of other necessities of life.
Bramley (1994)	Households should be able to occupy housing that meets well established (social housing) norms of adequacy (given household type and size) at a net rent which leaves them enough income to live on without falling below some poverty standard.
Freeman <i>et al.</i> (1997)	Definitions of affordability concentrate on the relationship between housing expenditure and household income and define a standard in terms of that income above which housing is regarded as unaffordable.

Author	Definition
Field (1997)	Affordability involves making normative judgments about the proportion of income a household should pay for housing (rent or monthly ownership) costs.
Urban Research Centre (2008)	Affordable housing – housing that is appropriate for the needs of a range of low to moderate income households and priced so that low and moderate incomes are able to meet their other essential basic living costs.
Fisher <i>et al.</i> (2009)	Definition of affordability should consider the opportunity costs facing households due to housing location, given that the purpose of affordable housing policy should be not only to provide adequate housing but, in addition, to supply homes that are in safe areas and are accessible to jobs and decent schools.
Stone <i>et al.</i> (2011)	Affordability cannot be divorced from housing deprivation and housing standards. If a household is achieving “affordability”, but only by virtue of living in overcrowded conditions, with insecure tenure or in unsafe or inaccessible locations, it is not affordability.
Leishman and Rowley (2012)	Affordability is a wide concept that incorporates housing standards and appropriateness, economic participation and social and neighbourhood issues.
Rowley and Ong (2012)	The quality of a neighbourhood has to be taken into account when assessing the appropriateness of housing that is considered as “affordable” in terms of cost traditional indicators of housing affordability simply address the financial burden of housing costs, neglecting the fact that a household may have avoided a situation of housing stress by compromising in terms of location or housing quality.
ACF & VCOSS (2014)	Housing affordability must take into account, not simply rent or mortgage costs, but also a wider range of costs that households face, e.g., accessing employment, services and facilities and energy costs.
Mulliner and Maliene (2015)	“Sustainable housing affordability” is a concept that focuses on a households’ situation; it amalgamates specific economic factors directly related to a housing affordability (i.e., the mortgage market, income and housing costs, availability of different housing tenures), along with the social (quality of life and aspects of community sustainability) and environmental factors (e.g., energy efficiency of housing), which directly relate to household well-being.

Quigley and Raphael (2004) note, that affordability is difficult to define, as it is linked with a number of disparate issues: the distribution of housing prices, the distribution of housing quality, the distribution of income, the ability of households to borrow, public policies affecting housing markets, conditions affecting the supply of new refurbished housing, and the choices that people make about how much housing to consume relative to other goods. According to authors, this mixture of issues raises difficulties in interpreting even basic facts about housing affordability.

There are two primary schools of thought on the meaning of housing affordability; one focuses on housing costs in relation to income and the other focuses on standards of housing and non-housing consumption and the income remaining once housing costs have been paid for. These ideas have fashioned two well-known and widely used affordability measures; the ratio approach and the residual measure (Mulliner, Maliene 2015). The residual measure is based on the notion that housing affordability is the ability of households to meet the cost of housing whilst maintaining the ability to meet other basic costs of living, i.e., the income left after paying for housing (e.g. Chaplin *et al.* 1994, Stone 2004; Burke 2004).

The ratio approach is the traditional and most commonly accepted way to define and express housing affordability internationally. However, a lot of academics highlighted its limitations. For example, early researchers Malpass and Mulie (1990) argue that affordability “is a virtually undefinable concept and certainly cannot be neatly or simply understood in terms of a fixed percentage of income” to be spent on housing costs. Difficulties arise in this respect because of the normative judgements required to set standards or an affordability level. Stone (1993) notices that affordability establishes the relationship between people and housing in monetary terms, but “at a deeper level affordability expresses a link between the social and economic system and the quest for the satisfaction of basic human needs that is not merely monetary”. However, the majority of affordability definitions applied and proposed still commonly focus exclusively on monetary issues related to housing. Bogdon and Can (1997) criticised the pre-existing affordability literature for its focus on the price of housing rather than the condition, location and neighbourhood characteristics of the “affordable housing”.

Traditional measures of affordability neglect the fact that a household may, in reality, only be able to “afford” housing in a certain location due to its lower quality or neighbourhood deprivation. Households, especially those on limited incomes, make trade-offs between what they desire and what they can afford to pay for housing (Ndubueze 2007). Additional costs may be imposed on households as a result of such trade-offs, both monetary and socio-economic costs, which are disguised by traditional definitions and measures of affordability.

Such costs could be detrimental to overall household wellbeing (Rowley, Ong 2012). Research in Australia attempts to link the concept of affordability with environmental sustainability, arguing that “true” housing affordability must take into account, not simply rent or mortgage costs, but also a wider range of costs that households face, e.g., accessing employment, services and facilities and energy costs (ACF & VCOSS 2008, cited from Mulliner, Maliene 2015).

Fisher *et al.* (2009) recommend that a more thoughtful definition of affordability should consider the opportunity costs facing households due to housing location, given that the purpose of affordable housing policy should be not only to provide adequate housing but, in addition, to supply homes that are in safe areas and are accessible to jobs and decent schools. Researchers call for a broader discussion and refinement of the criteria by which the suitability of affordable housing is judged, especially with respect to local amenities. This is a far more holistic way to conceptualise housing affordability – having regard for quality of life and wellbeing – as opposed to simply focusing on the financial issues that face households (Mulliner, Maliene 2015).

Seelig and Phibbs (2006) conducted qualitative analysis of housing affordability in order to appreciate how low-income renters understand affordability. They found that low-income families often did not choose to live in the lowest cost housing if it presented poor options in terms of amenity and location. Thus, while cost was an essential consideration, addressing needs or preferences for dwelling features, location or proximity to services and facilities was a priority for many low income renters, even though such choices resulted in tighter household budgets and paying more for housing. This research demonstrates that an array of attributes, in addition to purely economic factors, can influence a household’s perception of affordability.

Specifically, housing quality, location and access to services and facilities appear to be important considerations directly related to a household’s opinion of housing affordability (Mulliner, Maliene 2015). Literature suggests that there is an increasing need to gain a more encompassing understanding of housing affordability. Housing affordability is not a one-dimensional concept and should not be analysed using just one concept, measure or definition (e. g. Haffner, Heylen 2011; McCord *et al.* 2011). To assist in creating more affordable and also more sustainable communities the authors also postulate that it is important to move away from defining housing affordability as a purely monetary issue. Providing affordable housing is not simply about cheap and decent homes, there must be consideration for a broader range of factors that influence households and their quality of life. If participants in the housing market were to begin thinking in a different way about affordability then considerable positive effects on households and communities could be derived (McCord *et al.* 2011, cited from Mulliner, Maliene 2015).

The literature highlights a need to reconsider the way housing affordability is conceptualised. The term “sustainable housing affordability” has been proposed recently (Mulliner, Maliene 2011). According to authors (Mulliner, Maliene 2015), it may appear that the presented “sustainable housing affordability” concept is similar to that of “sustainable communities”. Therefore, the line between these two terms (“affordability” and “sustainable communities”) becomes blurred, and that is the intention. However, “sustainable communities” is a much broader concept that generally refers to interacting localities and neighbourhoods that promote sustainable living for present and future generations. Sustainable communities are sensitive to their environment, contribute to a high quality of life, provide opportunity and choice and meet the diverse needs of existing and future residents. Accordingly, sustainable communities include broad components relating to the overall governance of communities, consideration of the needs of future generations, environmental considerations and supporting social and economic prosperity. In comparison to “housing affordability” or “sustainable communities”, “sustainable housing affordability” is a concept that focuses on a households’ situation; it amalgamates specific economic factors directly related to a housing affordability (i.e., the mortgage market, income and housing costs, availability of different housing tenures), along with the social (quality of life and aspects of community sustainability) and environmental factors (e.g., energy efficiency of housing), which directly relate to household well-being. It ultimately encompasses both the positive and negative monetary (such as housing costs, income, the mortgage market) and non-monetisable outcomes (such as quality, housing availability, and location trade-offs) of a household’s decision to consume housing in a certain area; each of those labels – monetary and non-monetary – encompass a number of different criteria (Mulliner, Maliene 2015).

The complexity surrounding affordability means that there is no one measure for assessing the nature and degree of housing affordability problems. The challenge is therefore to identify the policy needs around the issues and to devise measures relevant to the policy requirements of identifying the scale and form of the problem, evaluating housing market trends, informing policy design or providing guidelines for industry (Gabriel *et al.* 2005). Analysis of housing affordability requires a system of qualitative and quantitative criteria, which is provided in Section 3.6 of this monograph.

Location of housing. As it was previously discussed (see Section 3.1), the optimal location of housing has direct implications for urban spatial efficiency, labour mobility and ultimately economic adjustment.

3.4. Housing Policy and Finance

Housing policy is considered to be part of the welfare state. However, over the last hundred years, the state's role in realisation of housing policy has been ambiguous. At present, in all developed industrialised countries the state intervenes in housing issues in one or another way and shapes housing markets (Doherty 2004). It has been also agreed that over the last decades the state's withdrawal from direct involvement in housing issues has been visible, thus leaving more and more initiative for the market and agencies of civil society (Doherty 2004; Clapham 2006; Arbaci 2007). Although, at the same time the state's withdrawal from the housing policy has been identified in Central and Eastern Europe (CEE) (see Ruoppila 2005). Increasing owner occupation, re-visualisation and retrenchment of social housing in Western Europe has been an outcome of the globalisation discourse rather than an outcome of the drastic economic and political change, as it was the case in many CEE countries. The globalisation discourse is based on economic liberalism. Therefore, the "housing policy measures, which have been pursued in reaction to it, have also been built around marketization and deregulation" (Clapham 2006). Another explanation of the shift towards housing marketization and deregulation in the West could be found in the "embourgeoisment" thesis which suggested that the newly affluent of Western Europe no longer had a need for subsidised basic housing; people now demanded choice in housing as an outlet for their new-found purchasing power – a choice best provided by the market not the state" (Doherty 2004). In the CEE privatisation, re-visualisation and marketization of housing was an outcome of the transition from a planned to a market economy. Nevertheless, the state's withdrawal from the housing policy was not uniform within the CEE countries as well as within the "old" EU welfare states. Study of Doherty (2004) show that in the EU countries, housing policy still differs remarkably and the evidence of the state's withdrawal is not conclusive (Aidukaite 2014).

In order to explain the differences in housing policy systems of various countries, scholars have attempted to reinterpret the Esping-Andersen's (1990) paradigmatic welfare state typology for the field of housing. Hoekstra (2003) has applied the Esping-Andersen's typology in studying the housing system in the Netherlands.

Hoekstra (2003) states, that the meaning of "the housing system" does not only encompass the housing market or housing sector, but also the organization of housing provision, subsidisation, rent regulation, general housing policy objectives and the level of state involvement in the housing policy. On the basis of the three criteria borrowed from Esping-Andersen (de-commodification, stratification and the arrangements between state, family and market), Hoekstra (2003) has identified three housing welfare regimes, which parallel Esping-Andersen's welfare regimes (social-democratic, conservative-corporatist and

liberal). Applying his concept of housing welfare regimes in order to examine changes in the housing system in the Netherlands, Hoekstra (2003) has shown that in the 1990s, the housing system in the Netherlands has developed into a distinct so called modern corporatist regime, which occupies intermediate position between the social-democratic (state provision of welfare services) and the liberal welfare state regime (market provision of welfare services). Hoekstra's conceptual framework helps understand the housing systems in different welfare state regimes. It is useful in many ways since it captures the main differences of the housing systems of various countries and explains how these differences operate and produce different outcomes such as availability, accessibility, affordability and quality of the housing stock (Aidukaite 2014).

According to Hoekstra (2003), in the social-democratic regime the level of de-commodification is high. Author defines de-commodification in the housing field as the extent to which households can afford their own housing independently of the income gained from participation in the labour market. The government can influence de-commodification through the price regulation and via housing subsidization both object and subject. The object subsidies refer to production subsidies affecting the price of housing. The subject subsidies refer to subsidies which affect the household income that can be general income support (pensions, unemployment benefits) and subsidies that are specific to the field of housing. Other authors suggest that availability and the proportion of social housing within the stock can be also a measure of de-commodification (Allen 2006). Thus, under the social-democratic regime the state is the main provider of welfare and its influence in the housing policy is high. Under this regime there is no preferential treatment for traditional families and welfare is provided on the basis of individual needs and rights. The state takes the initiative for the production of newly built houses and provides large-scale production subsidies as well as subsidies for large target groups. The state's influence on price setting and price regulation is strong and majority is guaranteed a universal high level of housing quality (Aidukaite 2014).

In the conservative-corporatist regime de-commodification is quite large, but not as large as in the social-democratic regime. The level of welfare services to which a person is entitled depends on the person's occupation and/or social status. Under this regime, the degree of political corporatism is high. The provision of welfare services is often explicitly aimed at the preservation of a traditional family (Aidukaite 2014).

Therefore, regulation tends to favour the breadwinner or give extra benefits for large families. In the conservative-corporatist welfare state regime, families are assumed to provide many welfare services themselves; therefore, the state's position is important but subordinated to the traditional family's needs and preferential treatment (Aidukaite 2014).

The housing policy of the conservative-corporatist regime seeks to preserve social stratification. Under the conservative regime, depending on which groups have privileged access to certain parts of the housing stock, stratification is high and based on status. This is maintained by different construction firms, which specialize in producing housing for high, middle and low income households at a small scale. The considerable influence of private non-profit organizations in the production of housing is also remarkable under this regime. However, the state intervenes in price regulation and offers tenure-neutral housing subsidies. Therefore, in the conservative-corporatist regime, home ownership is lower than the EU average and private rental housing takes over (Arbaci 2007; Hoekstra 2003, cited from Aidukaite 2014).

The liberal welfare state regime is characterized by the dominant position of the market and low de-commodification. Welfare services under liberal regime are provided on the basis of needs and income of an individual. Contrary to the two other regimes in which there are many corporatist structures and processes (Hoekstra 2003), under this regime the degree of political corporatism is low. Housing policy is dominated by the market. The state intervention in the housing policy at both central and local levels is low. Therefore, stratification is high and access to housing is mainly based on income. The state supports only marginal groups and provides social housing or means-tested subject subsidies and offers few production subsidies. Private actors (mainly big companies) take the initiative of the production of newly built houses. Under this regime, home ownership is high and results from the revisualisation and stigmatization of the social housing and predominance of the private rented housing over the social one (Arbaci 2007, cited from Aidukaite 2014).

Table 3.2 provides special characteristics and main housing problems in the countries of different welfare state models.

Housing for many households around the world is both the largest expense and the most important asset. For all households it is an important determinant of quality of life. For the majority in developed countries, and for some in emerging market economies, housing is adequate. But a significant proportion of the world's population does not have access to adequate and affordable housing (V. C. Warnock, F. E. Warnock 2008).

According to UN-Habitat (2005), roughly one billion people, or one third of the world's urban population, live in slums. And a well-functioning housing market influences not only shelter concerns. At a basic level, a country's housing sector can improve public health (by reducing the likelihood of outbreaks of disease), stimulate economic growth (through its own job creation, but also as workplaces for home-based entrepreneurs), and have important social consequences (by influencing crime reduction and citizenship).

Table 3.2. Comparison between countries: the main features of housing policies

Welfare state model	Social-democratic	Corporatist	Liberal	
Country	Sweden	Germany	UK	Lithuania
System of housing rents	Unitary	Unitary	Dualistic	Dualistic
Special characteristics	High quality and accessibility of housing, significant state regulation	Developed and high quality private rented sector, state support focused on the traditional family	The market regulates the prices of housing, housing construction and distribution	Housing prices set by the market, the state supports only separate groups (low-income, orphans, the disabled)
Main problems	Social exclusion areas formed in the peripheries of cities	The differences among the Western and the Eastern parts of Germany in quality housing. Private landlords discriminate certain groups of tenants	Social exclusion fireplaces formed in the peripheries of major cities, social housing shortage, declining housing affordability	Lack of high quality housing, housing renovation and maintenance problems, lack of social housing, housing administration problems

The best housing sectors should enable the adequate provision of shelter across all segments of the population. While there are many aspects to the housing market (discussed below), it can be argued that the provision of housing finance is a constraint that must be addressed before the market can sustainably provide adequate housing (V. C. Warnock, F. E. Warnock 2008). Even in the best of environments, housing is a major purchase – average home prices typically ranging from 4 times annual income in developed countries to 8 times annual income in emerging economies (Ball 2003) – that is affordable only when payments can be spread out over time. Absent a well-functioning housing finance system, for many the market-based provision of formal housing will be neither adequate nor affordable.

Other housing or housing finance solutions are possible – such as subsidies and the outright provision of public housing – but these can be unsustainable (Quigley 2000).

While housing finance is a vital component of a well-functioning housing system, to date there has been some systematic analysis of the depth of housing

finance across a broad set of countries: Chiquier *et al.* (2004) included case studies of eight emerging market economies. Hegedüs and Struyk (2005) presented case studies on seven transition economies and Germany and tabulate housing finance statistics. Chiuri and Jappelli (2003) analysed 14 developed countries (with an emphasis on loan-to-value ratios). Allen *et al.* (2004) included a short section on mortgage markets in 17 developed countries, etc.

Extensive research was performed by V. C. Warnock and F. E. Warnock (2008). Authors analysed the determinants of the extent of housing finance in a sample of 62 countries that includes both developed countries and a wide range of emerging economies. Across all countries, controlling for country size, they found that countries with stronger legal rights for borrowers and lenders (through collateral and bankruptcy laws), deeper credit information systems, and a more stable macroeconomic environment have deeper housing finance systems. These same factors also helped to explain the variation in housing finance across emerging market economies.

One can view the housing finance sector in terms of supply and demand. Demand for housing finance is in a sense a derived demand that flows from the demand for housing, which in turn depends importantly on the rate of household formation and income levels. In addition, with housing costs typically being a multiple of annual income, housing is made affordable by spreading payments over time, so adequate housing finance must be longer term in nature (V. C. Warnock, F. E. Warnock 2008).

On the supply side, one way to think about the provision of housing finance is to split it into two components: 1) the provision of housing finance by a lender who has ample funds at hand, and 2) the mobilization of funds within an economy so that lending institutions have access to funds. For lenders with adequate funds to choose to allocate some portion to long-term housing finance, a number of preconditions should be in place (V. C. Warnock, F. E. Warnock 2008). These preconditions are summarised in Table 3.3.

In summary, a basic infrastructure that can enable a well-functioning housing finance system includes factors that promote long-term lending (the ability to value property and to seize it in the case of default, information on the creditworthiness of potential borrowers, macroeconomic stability) and factors that promote the mobilization of funds (be it through savings and deposits, capital markets, a governmental liquidity window, or secondary markets) (V. C. Warnock, F. E. Warnock 2008).

The efficacy of housing finance systems can be measured along many dimensions. One measure would be the portion of households that has access to housing finance products. An important determinant of access so defined is the range of financing products that is available. Such products can range from interest-only loans, etc.

Table 3.3. Preconditions for long-term housing finance (created by authors basing on V. C. Warnock, F. E. Warnock 2008)

Preconditions	Explanations
Information on the borrower	To adequately price a loan, a lender must have information on the credit worthiness of prospective borrowers that enables the determination of the probability of default. The information could be produced by a standardized and accurate source of credit history – such as public credit registries or private credit bureaus. Best is if the source has a wide coverage of the population, and the most informative source would include negative as well as positive transactions.
Ability to value the property	There should be an ability to determine the market value of the property. This is a natural outcome of a well-functioning housing market in which detailed information on housing transactions is maintained in a systematic way. For example, if data on the sales price and relevant features of the home (location, size, age, etc.) are maintained in a mandatory property registry, appraisers can more accurately value prospective homes for the lenders and borrowers.
Ability to secure collateral	The lender should be able to secure collateral against the loan in case of default. The house itself is an obvious candidate for that collateral, providing that in the case of default the lender can seize the property. To seize the property requires that there is something resembling clear title and that the legal system allows the lender to seize collateral.
Macroeconomic stability	The macroeconomic environment should be stable. If inflation is volatile, the lender would incur substantial interest rate risk if it lends at a fixed rate. In an unstable environment, lenders will typically pass on this risk to the borrowers – who are less likely to fully understand it – by only offering floating rate loans.
Sources of funds	In the primary market, deposit-taking institutions, such as banks, can fund mortgages through deposits. However, because deposits are short term, if this is the only source of funds housing loans will tend to be short term or at variable rates.
Additional sources of liquidity	Whatever the usual sources of funds, it is important to have a back-stop, such as a governmental liquidity window, in case of temporary liquidity crunches.

Very few emerging economies – Malaysia, Thailand and some transition economies in Eastern Europe – have typical maturities of 30 years. Another, non-overlapping subset of emerging economies tends to have fixed rate mortgages. Thus, no emerging market appears to have widespread availability of long-term fixed rate mortgages. In contrast, many developed countries have mortgages with terms of 25 years or greater, and roughly half have predominantly fixed rate products (V. C. Warnock, F. E. Warnock 2008).

Other measure of depth is the sheer size of the housing finance market. Larger housing finance markets likely reach a greater proportion of the population. Size is not a perfect indicator of efficacy, though, as it is also influenced by price dynamics and tax considerations. For example, a housing bubble requires, all else equal, a larger housing finance market and favourable tax treatments in countries such as Netherlands, Switzerland, and the USA tend to result in a larger stock of mortgage debt (V. C. Warnock, F. E. Warnock 2008).

In summary, housing is a major purchase requiring long-term financing, and the factors that are associated with well-functioning housing finance systems are those that enable the provision of long-term finance. Countries with stronger legal rights for borrowers and lenders (through collateral and bankruptcy laws), deeper credit information systems, and a more stable macroeconomic environment have deeper housing finance systems. These same factors also help explain the variation in housing finance across emerging market economies. Across developed countries, which tend to have low macroeconomic volatility and relatively extensive credit information systems, variation in the strength of legal rights helps explain the extent of housing finance (V. C. Warnock, F. E. Warnock 2008).

Furthermore, it is possible to consider housing policy indicators along three dimensions: fiscal, financial and real sector policies (Buckley, Tsenkova 2012).

Fiscal indicators measure the efforts of the government to transfer resources either towards or away from a good. These transfers can either be direct expenditures of the government, positive or negative (i.e., a tax), or indirect, such as rent control, and distributed in accordance with various levels of efficiency, transparency, and distributional equity. Improved housing subsidy transparency would enable better targeting and accountability of public funds. It would also provide a clearer signal to renters, homeowners and others in the private sector. Finally, very important measure is the sustainability of the level of subsidies. How big a share of GDP is being provided by housing subsidies? Can this level be sustained within overall government budgets as these economies reduce the scale of government in the economy? (Buckley, Tsenkova 2012).

Financial indicators measure the ability of households to issue what should be their lowest cost debt against what is usually their largest form of wealth. Hence, the efficiency of this system can have implications for the way households arrange their savings as well as their housing decisions. Finance is also perhaps the central alternative to the use of government resources to pay for housing. It is a substitute for subsidies because when a good yields a flow of services over such a long period as a house does, the present value of its cost must by definition be a multiple of current income. Hence, housing purchases require either long periods of savings, access to borrowing, or subsidies. In a number of transition economies, the last pattern seems to dominate (Buckley, Tsenkova 2012).

Public/private role indicators. Perhaps the hallmark difference between housing systems in socialist and market economies is the role the public sector played in ownership and control of housing assets. The reliance on public control meant that in the extreme form of socialism, approximated perhaps only in the former Soviet Union, all the risks inherent in using and producing these assets – the risks that the investment would fulfil preferences as to size, the kinds of amenities, location, quality, not to mention the performance risks of construction, and the sensitivity of timing decisions to macroeconomic conditions, etc. – were borne by the state. To bear this risk, the state pursued policies, which distributed the costs of these risks among the population. For example, in many places it prevented or constrained any competition in production or even formal exchanges, it proscribed variations in prices, and prohibited, or deeply constrained, the ability to engage in exchange. These policies, in turn, placed implicit taxes on the sector, and ultimately the economy. The indicators in this category are designed to measure the extent of private ownership over housing assets, the degree of competition in the supply of new housing and the provision of land, as well as the development of market-based structures to operate and maintain the existing stock (Buckley, Tsenkova 2012).

3.5. Analysis of Housing Market Inefficiencies

3.5.1. Housing Market Fluctuations

Fluctuations of real estate markets were in detail discussed in Chapter 1 of this monograph. In this Section some more peculiarities of residential markets and their fluctuations are analysed.

Between the mid-1980s and today real house prices more or less doubled in most industrialised countries. Even before the recent crisis, this was not a smooth process of continuous growth. All countries experienced cycles where booms with price increases above trend were followed by busts with stagnating or falling prices. But price fluctuations alone do not fully characterise the ups and downs of the housing market. In price booms, the market is typically also more liquid with frequent transactions and houses selling quickly, whereas in busts there are fewer sales and many houses remain on the market for a long time (de Wit *et al.* 2013).

At any given time, market disequilibrium may originate from shifting supply conditions, changes in factors affecting demand, or some combination of the two. Supply-side shocks can arise from a variety of sources from rapid changes in building materials costs related to volatile materials markets or changes in international trade agreements. Changes in construction employment and wages as a result of strikes or labour disputes may also generate supply-side disturbances

as could changes in lending rates for construction and development loans (Riddel 2004).

Demand disturbances can be brought about by macroeconomic conditions or changes in household consumption behaviour. Unanticipated inflation and related fluctuations in mortgage interest rates or changes in marginal tax rates cause demand fluctuations. More recently, stock market volatility has affected household wealth and financial portfolios resulting in housing demand disturbances. Changes in households' tastes and preferences for home size, location, or other amenities can also induce disequilibrium (Riddel 2004).

It is not surprising that a market subject to frequent disruptions and fraught with information asymmetries, high transaction costs, and long investment horizons fails to instantly adjust to new information. However, if housing markets adjust slowly to changing demographic and macroeconomic conditions, then periods of sustained disequilibrium must be the norm. As such, knowledge of the source of market disequilibrium could be a useful addition to our general understanding of housing markets and how they operate (Riddel 2004).

Riddel (2004) developed a disequilibrium housing-market model that separates disequilibrium generated by supply-side disturbances from those arising from demand disturbances and applied it to the USA housing market for the period 1967–1998. He concludes that although price changes guide the market toward a new equilibrium, inefficiencies impede market clearing. Thus, the market is characterised by sustained periods of disequilibrium.

Housing markets typically exhibit a strong positive correlation between the rate of price increase and the number of houses sold (de Wit *et al.* 2013).

The positive correlation between price changes and transaction volumes in owner-occupied housing markets is by now a relatively well established empirical regularity, primarily for USA data but also for other countries, like the UK and Sweden. In fact, realtors and other market actors seem to take the fluctuations between hot and cold markets – differing both in price development and sales activity – as a basic fact of life. While this general pattern is confirmed by most studies, the empirical picture is not without ambiguity (de Wit *et al.* 2013).

Some authors have looked at the simple correlation between price changes and number of sales many years ago. An early paper by Miller and Sklarz (1986), based on condominium data from Hawaii, shows that the rate of sale in one quarter is positively related to the price change in the next quarter; sales predict price changes. Two influential theoretical papers include a look at aggregate US data. Stein (1995) reports a significant relation between current sales volume and last year's rate of price change, i.e. a temporal lag in the opposite direction to that found by Miller and Sklarz (1986). Berkovec and Goodman (1996) reveal the change in median sales price on the simultaneous change in turnover, with a significantly positive regression coefficient. Follain and Velz (1995) find the levels of

price and sales volume to be negatively correlated when estimated in the context of a four-equation model of the housing market (cited from de Wit *et al.* 2013).

On an information-efficient asset market without frictions a shock to fundamentals should have an immediate price effect. If supply adjusts only gradually as it certainly does in real estate, the initial price impact should overshoot the final price change once a new long-run equilibrium has been reached. In contrast, several empirical studies have shown that house prices respond only gradually to shocks. This indicates that returns to investing in housing are predictable, but given the large transaction costs it is not clear that there are unexploited profit opportunities (de Wit *et al.* 2013).

More interesting, however, is to compare the time profile of the price response with that of the number of houses sold. Two papers on European housing markets estimate the joint dynamics of sales and prices. Hort (2000) finds no consistent relation between price changes and turnover changes for local housing markets in Sweden. Fixed effects regression on sales against the house price level yields negative coefficients at all frequencies. Author then goes on to investigate how shocks to fundamentals (represented by the after tax mortgage rate) are transmitted into house prices and sales. Based on a vector autoregression (VAR) model she concludes that an interest shock has an immediate negative impact on sales but depresses prices only gradually. More recently, a study on aggregate UK data by Andrew and Meen (2003) focuses on the adjustment to fundamentals within an error-correction framework. In a first stage, they estimate a long run levels relation between price and fundamentals represented by income, the housing stock, the number of households and construction costs. In a second stage, a two-equation conditional VAR-model is estimated where price change and the number of sales (as a fraction of the stock) are driven by deviations from equilibrium (the residuals of the first-stage equation). The results indicate that a shock to fundamentals impacts on sales and prices in the same direction. The sales effect peaks after about a year and sales revert back to their original equilibrium level after a couple of years. Prices, on the other hand, continue to fall for more than two years before turning and oscillating back towards the new equilibrium level (de Wit *et al.* 2013).

More recently, the price-volume correlation has also been addressed for a large panel of US local housing markets by Clayton *et al.* (2010). They estimate a two variable VAR in price and turnover (defined as the ratio of the number of sales to the housing stock) with fundamentals entering as exogenous variables. Like other studies, they find that a shock to fundamentals has a much larger impact on turnover than on price. But contrary to other studies, they find that the dynamic profiles are about the same. Both the price and quantity responses peak in the first quarter after the shock. The sign of the co-movement between price and turnover depends on the type of shock.

The papers reviewed above typically look at correlations at quarterly or yearly frequencies. There also seems to be a correlation in seasonal patterns. Ngai and Tenreyro (2010) document (both for US and UK data) that house price increases are systematically larger over the summer season (second and third quarters) than during the winter (fourth and first quarters). The difference is substantial, on the order of 5% annualized. Correspondingly, there is also a seasonal pattern in sales with increases during summer and decreases during winter. They develop a search model of the housing market, where exogenous seasonal variations in mobility (e.g. related to the school year and moving costs) give rise to systematically higher prices in the summer due to improved matching between sellers and buyers (thick market effects) (de Wit *et al.* 2013).

Several mechanisms can give rise to a correlation between price and quantity. A main class of theories emphasize that houses are traded on a search market. Formal models mostly focus on steady-state equilibrium, but there are also examples of dynamic search analysis outside of equilibrium (de Wit *et al.* 2013).

The early research by Wheaton (2008) has been followed by search models Novy-Marx (2009), Diaz and Jerez (2010), Genesove and Han (2011), and Ngai and Tenreyro (2010), among others. In housing markets, most households own only one unit. This means that a mismatch between the number of units and the number of households – due to building, migration and household formation – can have a strong influence on the equilibrium. One category of households owning two units are movers, since households typically buy a new house before selling the old one. Households that are not content with their current housing situation search for new houses and put their current homes up for sale only once they have found a new house that matches their wishes. As a result, there are three categories of households simultaneously in the market: matched households with one house, matched households owning two houses (one of which is vacant) and mismatched households. In equilibrium, the total number of houses, which is exogenously given in the model, equals the total number of households, also exogenous, plus the number of households owning two houses, which is endogenous. In steady-state equilibrium, the fraction of households in each of the three categories is constant over time. An increase in the number of vacant units (due either to a change in supply or to a change in demographics) leads to a price decrease and a decrease of the rate of sale. An increased mobility rate leads to higher price and an increase both in the rate of sale and in the rate of entry of new houses for sale. Hence, comparing across steady-state equilibrium that differ in vacancies and/or mobility, the model generates a positive correlation between price and the rates of sale and entry (de Wit *et al.* 2013).

In a search market, a correlation between price and volume may also reflect variations in liquidity and the quality of matching between buyers and sellers. This connection has been analysed by Novy-Marx (2009) and Genesove and Han

(2011). In random matching models like those of Novy-Marx (2009) and Genesove and Han (2011), a key feature is that the rate of matching between buyer and seller depends on the ratio of the two parties; the more buyers there are in the market the higher is the rate at which a seller finds a match and hence that a house is sold. A demand increase, e.g. due to increasing income, increases the value of search and stimulates the entry of new buyers into the market. This will increase the ratio of buyers to sellers thereby leading to an increase in the rate at which sellers are matched with buyers and, hence, a positive correlation between price and the rate of sale. In Novy-Marx's (2009) analysis there is also a feedback effect as the ratio of buyers to sellers is further increased as a transaction is concluded and a house is taken off the market.

A price-volume correlation may also arise due to asymmetric information between buyer and seller during the adjustment towards equilibrium (de Wit *et al.* 2013).

The institutional structure of most housing markets is such that supply information about houses for sale, including asking prices, is publicly available through listing services and internet web sites. But there is no corresponding comprehensive information about the demand side of the market. Hence a sudden shift in the number of buyers and their willingness to pay may not cause an immediate shift of seller reservation prices, as it would if buyers and sellers were equally informed. As a result, the rate of sale would tend to go up in the short run as sellers gradually learn about the demand shift. Hence, prices tend to increase and the rate of sale is higher than normal during an adjustment process to a new equilibrium price level. Genesove and Han (2011) include this mechanism in an extension to their equilibrium matching model.

A related analysis was conducted in an earlier paper by Berkovec and Goodman (1996), where neither party has a complete overview of the market. Sellers and buyers are assumed to observe transaction prices but otherwise to be uninformed about underlying market conditions. They adjust their perceptions of the market price level gradually based on observed prices until a new stationary equilibrium is reached where prices conform to expectations and flows in and out of the market are equal. As a result, a demand increase (a higher arrival rate of potential buyers) leads to an immediate increase in transactions followed by a gradual increase in reservation and transaction prices (de Wit *et al.* 2013).

Turnover remains above normal during the transition to the new higher equilibrium price. In a stationary equilibrium, transaction prices adjust such that the number of houses on the market is constant, i.e. the arrival of new sellers exactly matches the number of houses sold. The model gives rise to a positive correlation between price change and turnover during the transition process. This property is driven by the assumption that price expectations do not fully reflect current market conditions but adjust mechanically to the difference between last

period's price and the price that would be required in order to equate the rate of entry and exit from the market. Once in full equilibrium there is no price-volume correlation (de Wit *et al.* 2013).

Leaving search theory, a positive correlation between price and quantity may also arise due to financing constraints, which tend to become more or less binding as house prices go down and up. This link was first explored by Stein (1995). When house prices increase for fundamental reasons, this also improves the equity position of incumbent homeowners and allows them to enter the market for a larger house. In this type of model higher prices and more mobility go hand in hand. A positive shock to fundamentals will have a primary effect on price as well a secondary effect on demand – and hence on price – as previously credit constrained households will demand more housing. This means that more households want to move, i.e. the entry of new houses for sale will increase. Hence, the shock to fundamentals will start a cumulative process where prices overshoot the new equilibrium and transactions increase (de Wit *et al.* 2013).

The various theories presented differ in their empirical implications. In the credit constraint story, causality runs from fundamentals to prices and to houses bought and sold with feedback effects back to prices. One prediction from this theory is that shocks to fundamentals should have an impact on the entry of new houses onto the market (and on price). Another prediction is that prices, under some conditions, should overshoot on their path to the new equilibrium. The theory has nothing to say about the micro structure of markets, i.e. it does not yield predictions about the rate of sale. In the equilibrium matching models, more houses on the market improve liquidity and facilitate good matches between buyer and seller. This implies that in a more liquid market, with a higher rate of entry of new houses onto the market, the rate of sale should be higher and possibly also prices (de Wit *et al.* 2013).

A negative shock depresses prices and locks households into their current housing. Stein's argument was later developed in an explicit equilibrium model by Ortalo-Magné and Rady (2006). Authors derive conditions under which house prices will overshoot in response to endowment shocks and price and sales volume will be positively correlated. This happens if first-time buyers are sufficiently short of wealth and the housing demand of unconstrained households is sufficiently price inelastic. This result is generated in a model with continuously market-clearing prices, where all house entered for sale are being sold. Hence, this version of the theory has implications for the rate of entry of houses for sale but not for the rate of sale of houses on the market (de Wit *et al.* 2013).

Yet another explanation for the price-volume correlation derives from behavioural considerations. A couple of studies have found evidence that homeowners have an aversion to making losses. Genesove and Mayer (2001) and Engelhardt (2003) represent seller behavior by prospect theory. Assuming that the purchase

price serves as a reference point, the marginal disutility of nominal losses exceeds the marginal utility of gains. If this is so, sellers should be reluctant to setting an asking price below their original purchase price. Both papers find empirical support for this hypothesis. Genesove and Mayer (2001) analyse detailed data on condominium sales in Boston and find that owners with nominal losses set higher list prices and accept longer selling times than other sellers. Engelhardt (2003) from nationwide US data finds that loss aversion has a significant impact on intra-metropolitan mobility (de Wit *et al.* 2013).

The asymmetric information mechanism emphasizes the adjustment process outside of equilibrium. In one version of this theory, buyers demand is affected by shocks to fundamentals but neither buyers nor sellers are fully informed about (or capable to infer) the market consequences of changes in fundamentals (de Wit *et al.* 2013).

They will adapt their expectations about market equilibrium prices only gradually as a result of observed transaction prices and time on the market. Under such conditions, shocks to fundamentals would have an immediate impact on the reservation prices of buyers but a delayed impact on the reservation prices of sellers. As a result the rate of sale would shoot up immediately but prices would only adjust gradually (de Wit *et al.* 2013).

Most studies of the price-volume correlation have been confined to looking at transactions prices. Several earlier and recent papers have analysed the optimal choice of reservation price but only a handful deal specifically with the choice of list price (e.g. Yavas, Yang 1995; Knight 2002; Anglin *et al.* 2003; Haurin *et al.* 2010). They show that the choice of list price depends, among other factors, on the seller's utility cost of waiting, which is a function of personal characteristics like the financial situation of the household and whether the household is moving geographically. The list price also depends on the interest rate, which represents the financial opportunity cost of waiting. Hence, one would expect to see sellers setting low list prices in relation to expected sales prices and houses selling quickly in times of high interest rates.

de Wit *et al.* (2013) analysed high-quality Dutch data for the period 1985–2007, and estimated a VEC-model that allows studying the mechanism giving rise to the correlation. The data identify the flows of new houses offered for sale as well as the number of houses sold. According to the estimated model, shocks to market fundamentals (the mortgage rate) have an immediate and significant impact on the rate of sale, little impact on the rate of entry of new houses for sale, and a gradual impact on the house prices. This pattern is consistent with an economy where buyers and sellers gradually learn about changes in market conditions.

These findings are in line with previous studies by Hort (2000) on Swedish data and Andrew and Meen (2003) on British data, although these studies look

at total sales rather than the rate of sale. It stands in some contrast to a study on US data by Clayton *et al.* (2010), which finds that the effect on both price and sales peak already one quarter after the shock.

de Wit *et al.* (2013) conclude that it is consistent with a housing market where agents gradually learn about changed market conditions, e.g. because sellers have a good overview of the houses offered for sale whereas buyers do not have a corresponding overview of potential buyers searching for a new dwelling.

Authors of this monograph also analysed correlation of housing sales and prices in Lithuania, during the period of 2004–2014. Unfortunately, analysis revealed no significant correlations among these variables ($b^* = -0.23$; $R^2 = 0.0515$). Accordingly, it seems that the housing market is affected by other factors, rather than on simple housing supply and demand mechanisms.

Previous considerations impose a need to analyse housing markets' inefficiencies in more detail. For this purpose it is necessary to return to housing booms and busts.

3.5.2. Booms and Busts in Housing Markets. Determinants and Implications

The global nature of the financial crisis, in the context of a sharp weakening of the housing sector in many countries, has increased calls for monetary and regulatory policy makers to take into account emerging housing/asset price booms in their policy assessment and to develop early-warning devices for their identification. Booms are defined as price rises of major duration and amplitude that deviate significantly from long term trends. These might (ultimately) turn into the reverse phenomenon, i.e. busts (Agnello, Schuknecht 2011).

The literature on booms and busts analysis is varied. The traditional literature analyses the determinants of housing prices and the more recent one that focuses on the macroeconomic and policy implications, related to the existence of asset price misalignments (e.g. McCarthy, Peach 2004; Himmelberg *et al.* 2005; McQuinn, O'Reilly 2007, 2008; Tupénaitė, Kanapeckienė 2009; Kakaklauskas *et al.* 2010a, b, etc.).

As to the first question, the empirical literature is vast (see, e.g. Leung 2004; Gilchrist, Leahy 2002 for a survey). So far, the inter-linkage between housing markets and macroeconomy has been documented for countries that offer availability of long time series of housing prices (see e.g. Catte *et al.* (2004) for the case of the USA and Bowen (1994) for the case of UK).

Single and cross-country studies generally find that housing markets and the macroeconomy are strongly interrelated at country-level and internationally correlated. Such studies show that, at national and regional levels, housing prices are strongly influenced by the business cycles and therefore driven by

fundamentals like income growth, industrial production and employment rate (see Hwang, Quigley 2006; Ceron, Suarez 2006). Moreover, financial variables such as interest rate, money and credit supply have been found related to housing prices developments (see e.g. Kasparova, White 2001; Gerdesmeier *et al.* 2009; de Witt *et al.* 2013) also on the grounds that there may be credit rationing (e.g. Tsatsaronis, Zhu 2004). Differences in real estate prices dynamics across countries can also be traced back to differences in regulatory setting and mortgage market features (Adams, Füss 2010). As regards non-economic domestic indicators, Parker (2000) and Jud and Winkler (2002) conclude, for example, that real housing appreciation is strongly influenced by the growth of population (Agnello, Schuknecht 2011).

In contrast to other capital market assets, real estate prices do not change immediately after economic news have been released and generally exhibit low price fluctuation. Residential house prices particularly exhibit strong downward price stickiness since homeowners have high reservation prices or simply resist selling their house below a certain price during recessions. Thus, real house prices tend to decrease through inflation rather than through nominal price reductions. Price inertia, however, also influences the behaviour of housing prices during economic booms since exuberant expectations of house owners facilitate the formation of housing bubbles (Adams, Füss 2010).

Case (2000) and Catte *et al.* (2004), among others, have studied the propagation of macroeconomic shocks on the USA house prices. Macroeconomic shocks such as unexpected changes in the money supply, industrial production, or interest rate changes affect house prices with a lag depending on the speed of the propagation mechanism. The speed of propagation is strongly influenced by the efficiency of the institutional framework such as the land availability, zoning regulations, and the speed of administrative processes. Other variables such as credit supply, transaction costs, and mortgage product innovations also play a major role.

For instance, if changes in interest rates propagate quickly into changes of mortgage market interest rates then an increase in the money supply affects housing markets much faster than in a situation where most mortgage rates are fixed and the mortgage market is generally inefficient.

The credit supply for housing finance also varies among countries depending on the real estate valuation methods. If the valuation method reacts sensitively to changes in real estate prices and if the loan-to-value (LTV) ratio is high then rising house prices increase the credit supply more strongly and, vice versa, decreasing house prices lead to a shortage in the credit supply. A higher credit supply, in turn, increases the importance of interest rate changes as more firms and households rely on debt financing. Lower transaction costs lead to more transactions and thus to a faster response of house prices in face of a macroeconomic

shock. On the other hand, if the response of house prices is very low strong price reactions are more likely (Adams, Füss 2010).

House prices may also exhibit a feedback reaction to the macroeconomy. Rising house prices make homeowners feel richer because the value of their houses and thus the size of their collateral they can borrow on increases. For liquidity-constrained households increase in house prices may be their only opportunity to borrow at all. This wealth effect then increases consumption. A decline in house prices leads to a negative effect on consumption since decreasing house prices lead to more mortgage defaults and thus reduce the supply of bank credit as banks lose part of their bank capital (Parker 2000). Here, the mortgage market also plays an important role for the propagation of real house prices to the macroeconomy. Higher mortgage debt means higher leverage, through which changes in the interest rate can affect consumer spending.

Case (2000) finds that the effect of house prices on consumption is especially strong in the USA, where two thirds of all occupants are also owner occupants so that the wealth effect has a strong impact on consumer spending. Case *et al.* (2005) show that changes in real house prices can even impact consumption more strongly than changes in stock market prices, which might be due to the fact that house ownership is more evenly distributed across households than stock market wealth. In contrast, stock market wealth is mainly held by rich households. Since the propensity to consume declines with increasing wealth an increase in house prices should therefore have a stronger effect on consumption than an increase in stock prices.

Case (2000), Sutton (2002), Tsatsaronis and Zhu (2004), and Terrones and Otrok (2004) have studied global macroeconomic effects on real estate prices. Real estate markets appear to be highly correlated internationally although, being bound to a specific location, they are not substitutes. However, fundamentals like GDP which drive real estate markets are internationally correlated. The strength of those global factors depends on the openness of the country. GDP correlations were found to range on average from 0.33 to 0.44 (Case 2000).

Adams and Füss (2010) examined the impact of the macroeconomy on house prices. Using a panel data of 15 countries over a period of over 30 years allows for the robust estimation of long-term macroeconomic impacts. Data from 1975Q1 to 2007Q2 for the following countries: Australia, Belgium, Canada, Denmark, Finland, France, Great Britain, Ireland, Italy, the Netherlands, New Zealand, Norway, Spain, Sweden, and the USA were researched.

Standard theoretical equilibrium models are supported by the empirical results and suggest that macroeconomic variables significantly impact house prices. In particular, a 1% increase in economic activity raises the demand for houses and thus house prices over the long run by 0.6%. An increase in construction costs has an average long-term impact of 0.6% on house prices by reducing

housing supply, which leads to an increase in rents and thus in house prices. Finally, an increase in the long-term interest rate makes other fixed-income assets more attractive relative to residential property investment, reducing the demand for this kind of investment which in turn lowers house prices by 0.3% in the long run (Adams, Füss 2010). Authors found weak evidence of an international housing market result in the sense that a selected group of nine countries show a similar long-run response to macroeconomic changes. This may ultimately be useful for predicting the long-term tendencies of the global housing market in the presence of global macroeconomic shocks.

In contrast to current literature, findings of Adams and Füss (2010) suggest that the speed of adjustment to equilibrium may be actually much slower than has been previously suggested. While 14 years may at first appear rather long for nearly full adjustment, they believe it is a reasonable time frame given the stickiness in residential house prices.

So far, empirical evidence on the importance of international factors affecting national housing markets is scarce and still missing in what concerns, in particular, the role of global liquidity. Moreover, only few papers have tried to analyse the impact of the international regulatory framework of housing finance on housing prices. Exceptions include Muellbauer and Murphy (1997) and Iacovello and Minetti (2003) who argue that financial liberalization of mortgage markets led to a significant increase of the sensitivity of house prices to short term interest rates.

As to the second strand of literature, few recent studies have empirically examined the role of fundamental factors in explaining significant housing price swings under the label of booms and busts. To delineate booms and busts is a difficult exercise and involves different degrees of arbitrariness. However, the basic idea is to assume that such episodes occur when current values of asset prices are considerably out of line with an estimated historical reference level. Bordo and Jeanne (2002) detect a boom or bust in asset price series when its three-year moving average of the growth rate falls outside a confidence interval defined by reference to the historical first and second moments of the series. Interestingly, they show that a regular feature of boom–bust episodes is that the fall in asset prices is associated with a slowdown in economic activity as well as financial and banking problems.

Using an approach similar to Kaminsky and Reinhart (1999), Borio and Lowe (2002) define asset price booms as periods in which real asset prices deviate from their respective trends by a specific threshold amount. Their study shows that sustained credit growth combined with large increases in asset prices increase the probability of episodes of financial instability.

Detken and Smets (2004) define asset price booms as a period in which real asset prices are more than 10% above an estimated trend calculated recursively

using a one sided Hodrick–Prescott filter with a very high smoothing parameter. Looking at monetary policy developments during asset price booms, these authors find that high-cost booms experienced by a sample of 18 OECD countries are those in which real estate prices seem to follow a very rapid growth in the real money and real credit stocks just before the boom and at the early stages of a boom.

In line with this evidence, Alessi and Detken (2011) analysed sample of 18 OECD countries over the period 1970–2007. According to authors, global measures of liquidity, in particular a global private credit gap, are the best performing indicators and display forecasting records, which are informative for policy makers interested in timely reactions to growing financial imbalances.

Gerdesmeier *et al.* (2009) focus on the causes of asset prices bust episodes in a sample of 17 OECD industrialised countries during the period 1969Q1–2008Q3. Estimates of a Pooled Probit model show, that domestic credit aggregates, nominal long-term interest rates and investment prove to be the best indicators to forecast busts up to eight quarters ahead.

Besides the traditional relationship between asset prices and financial sector, other works explore the linkage between asset prices booms and busts, fiscal policy and external developments.

An assessment of fiscal policy stance during boom–bust phases in asset prices is provided by Jaeger and Schuknecht (2007). They find a strong reaction of fiscal revenue to asset price cycles which results in a ratcheting up public expenditure in booms and public debt in busts. By comparing the boom–bust cycles in Nordic countries with the average boom–bust patterns experienced by the other industrialised economies, Jonung *et al.* (2009) find that the highly volatile character of the Finnish and Swedish boom–bust cycle during 1984–1995 was mainly driven by financial liberalisation and a hard currency policy, causing large pro-cyclical swings in the real rate of interest transmitted via the financial sector into the real sector and then into the public finances.

More recently, Agnello and Sousa (2011) explore the multi-directional linkage between asset markets and fiscal policy for a set of 10 industrialized countries within a Panel VAR framework. They find that fiscal policy multiplier effects are strongly magnified in the context of severe housing busts and that equity prices rather than housing price upswings contribute to the goal of fiscal consolidation via wealth effects.

Work by Martin *et al.* (2007) provides evidence that exchange regime settings help to explain the occurrence of asset prices booms and busts. In particular, they find that “internal adjusters” countries (i.e. those countries that did not allow depreciation or that experienced an appreciation of their real exchange rate through the depreciation of their trading partners) experienced more protracted but less deep downturns than external adjusters as imbalances unwind more slowly.

Angello and Schuknecht (2011) performed extensive study on the characteristics and determinants of booms and busts in housing prices for a sample of eighteen industrialised countries over the period 1980–2007. The analysis was based on real housing prices annual data as provided by the Bank of International Settlement (BIS) over the period 1970–2007 for the following 18 industrialised countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdom, United States. From an historical perspective, authors found that recent housing booms have been amongst the longest in the past four decades.

The past decade has seen many of the most persistent and severe booms since the 1970s: 15 of the “top 25” booms identified occurred during the period since the mid-1990s. In fact, only Japan, Germany and Belgium do not report housing booms in the past decade. Sweden’s boom from 1997 to 2007 lasted 11 years and resulted in an above-trend increase of house prices by 67%. France follows with an above-trend increase by over 50% over nine years. Spain and the UK are represented twice in the “top 10” of the “boom severity league”. The magnitude of house price increases beyond trend ranged from 22% to 67% and the duration from 3 to 11 years. Japan’s famous boom of the 1980s has a surprisingly low boom severity score but this is mainly due to the fact that it was part of a longer boom that had started in the late 1970s and that was briefly interrupted in the early 1980s recession (Angello, Schuknecht 2011).

Of the 25 busts, about half occurred in the early to mid-1990s. In the case of Japan, the bust lasted until 2006 and house prices declined by about 45% as compared to the trend. The remaining busts seem more scattered over the previous 20 years. The Dutch bust around 1980 and the Finnish one from the early 1990s were the deepest with a fall by over 70% from peak to trough (Angello, Schuknecht 2011).

The largest group of countries (8) could be called “repeated boom busters”: the Nordics and the large European countries except Germany (i.e., Denmark, Finland, France, Italy, Norway, Spain, Sweden, and UK). Another three countries, Australia, Canada and the US could be called “new boomers”. Six countries, including Japan, Switzerland, New Zealand, Ireland, the Netherlands and Belgium could be labelled “long cyclers” where the Dutch boom already came to an end a few years ago and the upswing in Belgium is too slow and interrupted to be statistically labelled as a boom. Germany seems to be the odd country out where house prices have been relatively stable and even the recent drawn-out bust has been relatively shallow (Angello, Schuknecht 2011).

The period since the mid-1980s seems to feature more countries affected and more synchronicity across countries than the period before: booms in the late 1980s were often followed by busts in the early to mid-1990s. A renewed boom

since the late 1990s occurred in most of these and a further number of countries. Recent booms have not only affected the most countries; the group also includes the US and hence the country of most global relevance. Furthermore, the most recent booms have been longer (6–11 years instead of 3–8 previously). If it had not been for short interruptions (around 2001 when the dot-com bubble burst and economic growth slowed), we would have seen “mega booms” in Ireland, Denmark, Finland and Norway lasting about 15 years. The most recent busts have also been longer than earlier ones with Japan’s 15 years followed closely by Switzerland’s 10 and Germany’s eight (Angello, Schuknecht 2011).

Turning in some more detail to the results from our identification procedure, Angello and Schuknecht (2011) find that, over the period 1970–2007, nine out of twenty-five identified boom episodes were immediately followed by busts. When comparing experiences during booms with those during busts over the nine “full” cycles in our sample, a number of interesting patterns emerge. First, the persistence and magnitude (and, thereby, the severity indicators) are highly correlated or, in other words, long and severe booms tend to be followed by long and severe busts. Moreover, bust episodes mostly tend to be equally long or slightly longer and of an equal or higher magnitude than boom episodes. Only in two cases is the overall severity indicator in the late 1980s boom larger than in the subsequent bust (Spain and Sweden).

Angello and Schuknecht (2011) also compared the difference in certain macroeconomic variables across boom and bust episodes. They found that on average, real per capita growth was almost 3% lower during busts than during booms. Given an average bust length of 7.3 years, this translates into a relative output loss of about 20% of GDP (or 10% if one takes the average of boom and bust real growth as a proxy of the long term trend). The most significant difference is in real credit growth which had averaged about 7% during the boom before falling to –2.2% in the bust. Moreover, average output losses at the end of the entire boom–bust phase are positively correlated to the average credit growth over the housing boom period. This means that the larger credit growth over the boom phase, the greater is the average decline of real per capita GDP from boom to bust. As the short term interest rates, they were on average almost 2% higher during booms than during busts but the picture is more diverse (Angello, Schuknecht 2011).

Estimates of a Multinomial Probit model suggested that domestic credit and interest rates have a significant influence on the probability of booms and busts occurring. Moreover, international liquidity plays a significant role for the occurrence of housing booms and – in conjunction with banking crises – for busts. Authors also found that the deregulation of financial markets has strongly magnified the impact of the domestic financial sector on the occurrence of booms (Angello, Schuknecht 2011).

The relationship between interest rates and house prices under what can possibly be described as “normal conditions” has been extensively debated in the literature (Tse *et al.* 2014). Levin and Pryce (2009) argued that UK house price increases over the period 1996–2007 were driven by real interest rates and Ho and Wong (2008) demonstrated that in Hong Kong house prices were driven by the local equivalent of the UK central bank base rate. Fitzpatrick *et al.* (2007) also identified a long-run mutually reinforcing relationship between house prices and mortgage credit. It should also be noted that other research suggests that the relationship between interest rates and house prices might not be so clear cut. For example, Gilchrist and Leahy (2002) argued that monetary-policy-related interest rate movements have little direct effect on asset prices. This is however, perhaps only a minority view. Giuliadori (2005) examined the relationship between interest rate shocks and house prices across Europe between 1979 and 1998. He found that the impulse response to a 100 basis point shock varied considerably between countries. The UK however, was found to have a relatively large maximum response of about two percentage points after a lag of around 10 periods. Tsatsaronis and Zhu (2004) examined the data from 1970 to 2002 and found similar results using a variance decomposition methodology; the UK was found to be in a group of countries where a one percentage point fall in short term interest rates would increase house price inflation by about 2.6 percentage points. It is well documented elsewhere in the literature that bank lending plays a significant role in the monetary transmission mechanism.

Goodhart (1995) found that property prices significantly affect credit growth in the UK and Hofmann (2004) also argued that property prices are important in determining long-run borrowing capacity in the private sector. In a follow-up study Goodhart and Hofmann (2008) found evidence of a Pan-European multidirectional link between house prices and monetary variables (nominal changes in broad money supply and interest rates), with the strength of the linkages found to be stronger in more recent years (1985–2006).

What is perhaps less well documented in the literature is how financial and economic extreme events, like the 2007 financial melt-down, can influence the nature of the monetary transmission mechanism.

Su *et al.* (2012) found that real estate market efficiency tends to vary considerably over time and in a further study Wong *et al.* (2003) suggested that the causal relationship between house prices and interest rates can switch during economic cycles. In an examination of extreme events Tsai and Chen (2010) found that in the USA, the correlation between the Federal Fund Rate and real house prices changed significantly in response to a series of extreme events (for example, a stock market crash). European studies also found that changes in the relationship between house prices and interest rates might be expected in response to extreme shocks; for example, Bjørnland and Jacobsen (2010)

found that Norwegian, Swedish and British house prices reacted immediately and strongly to monetary policy shock. It should be noted that the previous paper cited does not fully address an issue that we feel is fundamental in modelling the relationship between interest rates and house-prices during periods of crisis; namely, it does not explicitly model the time lags involved.

Wilhelmsson (2008) found that the impact of interest rate adjustments on prices varies considerably on a regional basis. Some research has suggested that regional price differences are driven mainly by non-interest rate factors. For example, Robson (2003) found that regional house price differences were related to regional unemployment rates and that the transmission mechanism operated through the flows into and out of regional unemployment.

Tse *et al.* (2014) investigated the impact of the 2007 financial crisis on the relationship between real mortgage interest rates and real house prices. They apply a dynamic conditional correlation based methodology that uses fractionally differenced data along with controls for structural breaks and non-interest-rate related factors that influence house prices. The key finding made is that the financial crisis had a long-term structural impact on the monetary transmission relationship. For example, the mean conditional correlation between house prices in England and Wales and the three-year fixed mortgage rate rose by 6.6 percentage points. Similarly, the mean correlation between prices and the standard variable mortgage rate increased 6.4 percentage points to 54%. These findings suggest to us that interest-rate-based monetary policy still has an important role to play in the housing market.

Mian and Sufi (2011) document two striking stylized facts from the last recession. First, there was a surge in household leverage, defined as a debt-to-income ratio, during the 2002–2006 period. Second, the recession was worse and housing prices fell more in regions where household leverage had increased more. In addition, the nominal interest rate reached the zero lower bound (ZLB) in December 2008, worsening the recession because conventional monetary policy became ineffective in reducing short-term nominal interest rates to stimulate the economy.

Apparently, the household leverage, the housing market, and the ZLB played an important role in causing the worst recession that the USA has ever observed since the Great Depression. However, the standard deleveraging and ZLB literature that models debt limits exogenously, including Eggertsson and Krugman (2012) and Guerrieri and Lorenzoni (2011), has no implications of housing, household leverage, and the ZLB on asset prices and macroeconomic fluctuations under a credit shock.

Guerrieri and Lorenzoni (2011) model a debt limit and household heterogeneity in labour productivity. They show that a decline in the exogenous debt limit causes future consumption to be more volatile because with a lower debt

limit, it will be more difficult for households to insure their consumption risks. Therefore, savers will save more and borrowers will borrow less due to precautionary savings, resulting in a sharp decrease in the nominal interest rate and a binding ZLB.

Ngo (2015) examines implications of housing and household leverage on macroeconomic fluctuations under credit shocks in the presence of the zero lower bound (ZLB) on nominal interest rates. He finds that, under an adverse credit shock, only with high leverage can the housing model generate more macroeconomic fluctuations with the nominal interest rate being more likely to hit the ZLB, compared to the standard deleveraging model without housing. In addition, the relative amplification is more pronounced under a shock that causes the ZLB to bind in both the models. Importantly, the ZLB plays a key role in generating a significant decline in the housing price under a particularly adverse credit shock.

The 2007–2008 housing crisis that eventually culminated into a global economic recession, has led to an emerging literature attempting to understand the interrelationships among domestic and international regional (within country) housing markets and the effect of the crisis on different kinds of financial asset markets (namely stock and bond markets) (Yunus 2015).

Fadiga and Wang (2009) evaluate the dynamics in four USA regional housing markets including Northeast, Midwest, South, and West. Their results indicate that the principal source of secular price variability in the Northeastern and Western markets is due to two common stochastic trends, while a large share of transitional price variability in the Northeast, West and Midwest originates from three common stochastic cycles. They further show that unemployment, federal funds rate, corporate default risk, economic expansion, unanticipated inflation in the construction market are the key factors that affect both the short-run and the long-run housing dynamics.

Clark and Coggin (2011) also investigate dynamics of USA regional housing markets. Utilizing unobserved components, structural time-series analysis for the nine regional housing indexes, they show evidence in favour of regional house price convergence. The authors, however, contend that the simple error correction equation used in their study provide mixed and inconclusive results.

Lai and Order (2010) analyse the bubble in property values across cities in the United States. They find evidence of momentum in house price growth away from the underlying fundamentals throughout the 1980–2005 periods under consideration. However, their results indicate that the housing bubble was created somewhere around 2003 and was characterized by a series of positive, random shocks that were associated with the surge in the subprime market and the decline in short-term interest rates. Miles (2015) examine the degree of regional integration (or conversely segmentation) in US home values. His results indicate

that in contrast to prior findings in the literature, integration in the US actually fell over the early years of the bubble. However, he finds a very sharp rise in integration during the late stages of the bubble and attributes his findings to national and global factors.

In a more recent study, Yunus and Swanson (2013) investigate the dynamic interactions among nine US regional housing markets. Their results indicate that the extent of convergence among the regional housing markets substantially increased over time and more so after the housing bubble burst in the latter part of 2006. Further, their analysis reveals that the housing regions of New England, Mid-Atlantic and the Pacific were the primary regional drivers that led the regions toward long-run equilibrium during the 1975–2006 sub-period. Finally, their short-run analyses reveal substantial lead lag relationships among all the markets. In international context, Stevenson (2008) studies the price behaviour among regional housing markets in Ireland. Using a variety of methodologies, he finds that with the exception of a short period in the late 1990s when house prices appeared to have moved ahead of underlying fundamentals, the movements in regional house prices in Ireland can be attributed primarily to key economic fundamentals.

Similarly, Bourassa *et al.* (2009) examine three cities in New Zealand and investigate why prices among houses vary. Their findings suggest that in a bullish economies, smaller, older, centrally located properties exhibit larger price increases since these properties are in limited supply. Furthermore, the authors show that the values of atypical homes rise at higher than average rates in bullish economies, whereas the reverse holds in bearish markets.

Costello *et al.* (2011) analyse the linkages among Australian regional housing markets. Utilizing a dynamic present value model, they show evidence of periods of sustained deviations of house prices from values warranted by income for all state capitals starting around 2000. Investigating the impact/effect of the US housing financial crisis on international financial asset markets Dooley and Hutchison (2009) find that emerging markets were resilient to US financial crisis from early 2007 to summer 2008. However, from that point on these markets reacted quite strongly to the deteriorating situation in the US economy.

Guo *et al.* (2011) examine whether contagious effects exist among the stock market, real estate market, credit default market, and energy market. Their results indicate, a watershed of regimes around the start of the sub-prime crisis in 2007, after which the “risky” regime dominates the evolution of market chaos. Moreover, they show that during the financial crisis, stock market shocks and oil price shocks are the main driving forces behind the credit default market and stock market volatility.

Aloui *et al.* (2011) evaluate cross market interactions among US and the emerging markets of Brazil, Russia, India, China (BRIC) during the recent housing

crisis. Their findings indicate evidence of time-varying dependence between each of the BRIC markets and the U.S. market, but that the dependency is stronger for commodity-price dependent markets than for finished-product export-oriented markets. In a similar study, Syllignakis and Kouretas (2011) examine the potential contagion effects among the USA, German, Russian, and the CEE (Central Eastern European) stock markets. They show significant increases in conditional correlations between the U.S. and the international markets especially during the 2007–2009 financial crises. Their results also suggest that, domestic and foreign monetary variables, as well as exchange rate movements significantly impact the conditional correlations.

In a new study, Wang (2014) examines the integration and causality of interdependencies among six major East Asian stock exchanges, and their interactions with the USA before and during the 2007–2009 global financial crisis. Their findings reveal that the global financial crisis has strengthened the linkages among stock markets in East Asia. They also show that, East Asian stock markets are less responsive to the shocks in the USA after the crisis.

Yunus (2015) evaluates the degree of convergence among the housing markets of 10 major economies across North America, Europe and Asia. Long-run results indicate that the housing markets have become increasingly interdependent over time and more so after the onset of the most recent housing crisis. Short-run analysis suggests that the global housing markets have become more susceptible to shocks emanating from the US over the crisis and the post-crisis periods in comparison to the pre-crisis period. However, the US housing market is found to be highly exogenous and the global “leader” since it is influenced primarily by its own innovations and is not affected reciprocally by shocks originating from the international housing markets. Finally, the study shows that the trends and co-movements among global housing markets can be attributed to real convergence.

Larsen and Weum (2008) analysed the efficiency of housing market in Norway. They test the efficiency hypothesis on data from the housing market in Oslo over the period 1991–2002, employing the Case–Shiller time structure test on a repeat-sales house price index and returns to housing. Authors demonstrate that both the repeat-sales house price index and returns contain time structure and that the housing market is characterized by inefficiencies. They also find, surprisingly, that the housing market consistently yields higher appreciation at lower volatility than the stock market over the period (Yunus 2015).

Engsted and Pedersen (2013) have documented that changing expectations of future housing returns has been the main driver of housing market volatility in the OECD area in the last 40 years. News about future cash flows (rents) has not been completely negligible, but in the majority of countries cash flow news has played a minor role compared to discount rate news. When decomposing

returns into a risk-free rate (real interest rate) component and a risk-premium component, we find that changes in both components contribute to the volatility in returns. We have also documented that for the majority of countries part of the movements in housing returns is due to common global factors.

Common movements in real interest rates and risk-premia across countries are obvious candidates for explaining the common movements in returns. During the 1990s and first half of the 2000s, housing markets in many countries were characterized by easier lending standards and lower mortgage transactions costs, and – together with general financial market liberalisations and falling risk-aversion – this may have decreased risk-premia (Favilukis *et al.* 2012) thereby contributing to the house price boom up to around 2006. Fall in house prices after 2006 did not coincide with increasing interest rates; monetary policy rates have remained very low. The decreasing house prices after 2006 in many countries are more naturally explained by higher risk-aversion and tightening of credit constraints following the general economic downturn, especially the global recession beginning in 2008 (Engsted, Pedersen 2013).

Germany and Japan stand out as the only countries where movements in house prices have been completely unrelated to house price movements in other countries. The special economic and structural developments in Japan after the “bubble bust” in 1990 and in Germany following the German unification the same year are obvious explanations. In addition, in contrast to most other countries, house prices were not fuelled by an excessively loose monetary policy in these two countries (Ahrend *et al.* 2008).

3.6. Case Study: Analysis of Lithuania's Housing Market in the Context of the Other EU Countries

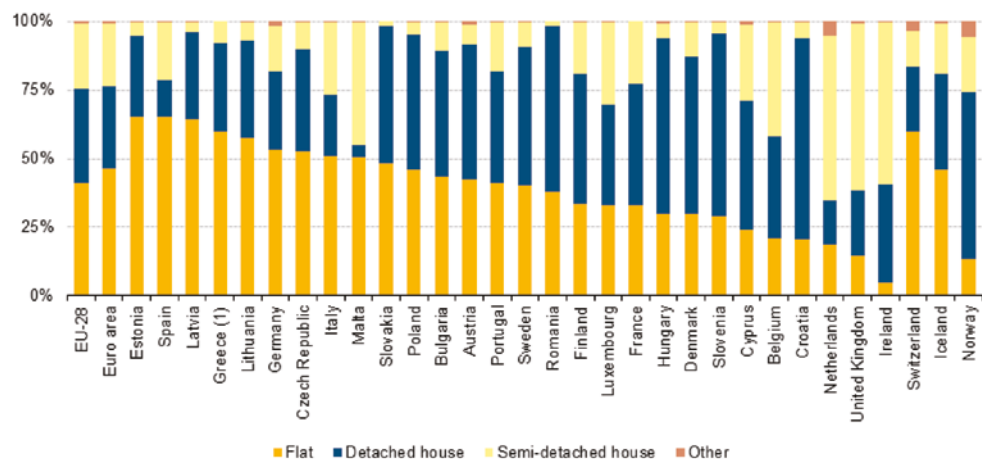
3.6.1. Review of Housing Characteristics in Europe

For review of the housing sector and housing conditions in the EU countries the newest available data from Eurostat (2014a, b) is used.

According to Eurostat (2014a), in 2012 41.6% of the EU-28 population lived in flats, just over one third (34.0%) in detached houses and 23.7% in semi-detached houses. The share of persons living in flats was highest across the EU Member States in Estonia (65.1%), Spain (65.0%) and Latvia (64.4%).

The share of people living in detached houses peaked in Croatia (73.0%), Slovenia (66.6%), Hungary (63.9%), Romania (60.5%) and Denmark (57.1%); Norway also reported a high share (60.7 %) of its population living in detached houses.

The highest propensities to live in semi-detached houses were reported in the United Kingdom (60.9%) and in the Netherlands (60.0%) – see Figure 3.5.



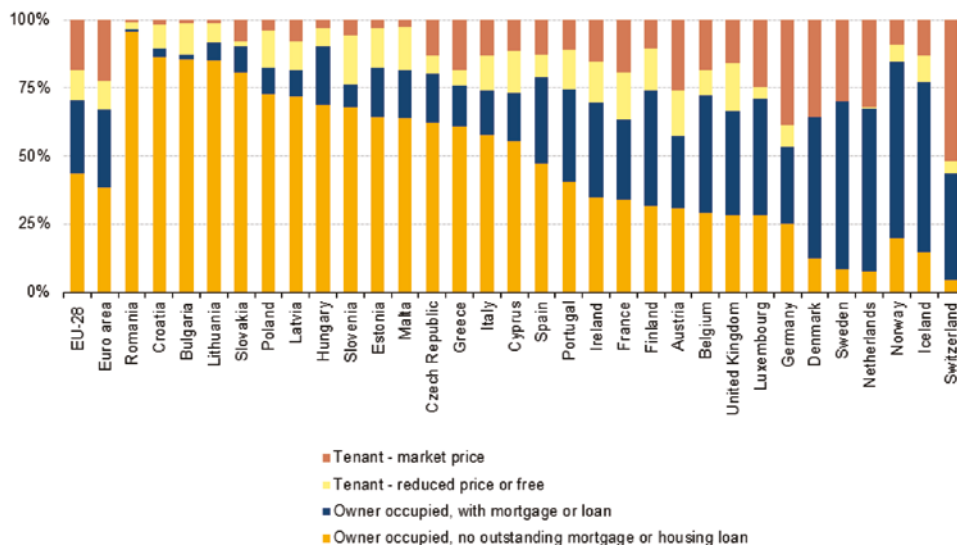
Source: Eurostat (2014a)

Fig. 3.5. Distribution of population by dwelling type in the EU, 2012

In 2012 over one quarter (27.2%) of the EU-28 population lived in an *owner-occupied home* for which there was an outstanding loan or mortgage, while more than two fifths (43.4%) of the population lived in an owner-occupied home without a loan or mortgage. As such, just over seven out of every 10 (70.6%) persons in the EU-28 lived in owner-occupied dwellings, while 18.5% were tenants with a market price rent, and 10.9% tenants in reduced-rent or free accommodation (Eurostat 2014a).

More than half of the population in each EU Member State (see Fig. 3.6) lived in owner-occupied dwellings in 2012, ranging from 53.2% in Germany up to 96.6% in Romania. In Switzerland, the proportion of people who lived in rented dwellings outweighed those living in owner-occupied dwellings, as some 56.1 % of the population were tenants. In Sweden (70.1%), the Netherlands (59.9%) and Denmark (51.8%) more than half of the population lived in owner-occupied dwellings with an outstanding loan or mortgage; this was also the case in Norway (64.9%) and Iceland (62.7%).

The share of persons living in rented dwellings with a market price rent in 2012 was less than 10.0% in 11 of the EU Member States. By contrast, close to two fifths of the population in Germany lived in rented dwellings with a market price rent as did more than one third of the population in Denmark, more than one quarter in the Netherlands, Sweden and Austria, and more than one fifth in Luxembourg. This share was even higher in Switzerland where it reached 51.6 %. The share of the population living in a dwelling with a reduced price rent or occupying a dwelling free of charge was less than 20.0% in all EU Member States (Eurostat 2014a).



Source: Eurostat (2014a)

Fig. 3.6. Population by tenure status in the EU, 2012

In 2012, an 11.2% share of the EU-28 population lived in households that spent 40% or more of their equalised disposable income on housing (see Table 3.4). The proportion of the population whose housing costs exceeded 40% of their equalised disposable income was highest for tenants with market price rents (26.2%) and lowest for persons in owner-occupied dwellings without a loan or mortgage (6.8%) (Eurostat 2014a).

The EU-28 average masks significant differences between Member States: at one extreme there were a number of countries where a relatively small proportion of the population lived in households where housing costs exceeded 40% of their disposable income, notably Malta (2.6 %), Cyprus (3.3%), Finland (4.5%), Luxembourg (4.9%) as well as France and Slovenia (both 5.2%). At the other extreme, around one third of the population in Greece (33.1%) and around one fifth of the population in Denmark (18.2%) spent more than 40% of their equalised disposable income on housing; these Member States were followed by Germany (16.6%), Romania (16.5%), Bulgaria (14.5%), the Netherlands (14.4%) and Spain (14.3%) (Eurostat 2014a).

Between 2011 and 2012, the *housing cost overburden rate* in the EU-28 decreased by 0.4 pp. In total, nine Member States reported for 2012 decreases, as compared to 2011, ranging from 0.1 p.p. in the Netherlands, to 9 p.p. in the United Kingdom (although for the latter this might be, at least partially, attributed to the reported series break in 2012). Iceland, Norway and Switzerland

Table 3.4. Housing cost overburden rate by tenure status, 2012 (% of population)

Country	Total population	Owner occupied, with mortgage or loan	Owner occupied, no outstanding mortgage or loan	Tenant – rent at market price	Tenant – rent at reduced price or free
EU-28	11.2	8.3	6.8	26.2	11.7
Euro area (EA-18)	11.7	8.9	5.3	26.5	11.9
Belgium	11.0	3.6	3.9	37.4	15.1
Bulgaria	14.5	8.0	13.5	48.2	19.7
Czech Republic	10.0	4.0	6.8	28.2	20.9
Denmark ¹	18.2	9.6	8.5	33.9	50
Germany	16.6	11.9	10.2	23.7	19.4
Estonia	7.9	8.4	6.4	27.9	9.4
Ireland	n/a	n/a	n/a	n/a	n/a
Greece	33.1	21.6	29.1	53.0	42.1
Spain	14.3	15.0	4.3	50.4	13.0
France	5.2	1.4	0.5	16.2	8.6
Croatia	6.8	13.6	5.9	33.1	9.3
Italy	7.9	5.6	2.3	33.5	9.7
Cyprus	3.3	4.0	0.2	19.9	1.1
Latvia	11.2	21.0	9.1	18.0	12.1
Lithuania	8.9	6.8	7.6	55.7	17.4
Luxemburg	4.9	1.1	0.6	17.1	1.7
Hungary	13.5	28.1	7.4	38.9	19.3
Malta	2.6	4.1	1.4	21.1	3.1
Netherlands	14.4	13.0	3.8	19.7	0.0
Austria	7.0	2.6	2.0	17.3	7.1
Poland	10.5	12.7	8.5	27.1	14.5
Portugal	8.3	7.2	2.8	35.9	5.6
Romania	16.5	42.1	15.7	76.3	21.4
Slovenia	5.2	8.7	2.8	26.6	6.1
Slovakia	8.4	24.8	5.7	15.1	8.7
Finland	4.5	2.5	2.6	11.8	9.1
Sweden ¹	7.6	3.7	11.3	16.7	20.3
United Kingdom	7.4	5.1	1.7	23.1	7.4
Iceland	9.0	7.7	4.0	18.1	14.0
Norway	9.9	8.5	3.8	30.9	14.5
Switzerland	12.0	6.7	8.8	16.6	10.0

¹ Tenants – rent at reduced price or free: unreliable

Source: Eurostat (2014a)

also reported decreases in respective housing cost overburden rates for 2012, as compared to the previous year. In two Member States, namely Slovakia and France, the rates remained stable. On the other hand, the largest increases were reported in Greece (an increase of 8.9 p.p.), Romania (an increase of 6.6 p.p.) and Bulgaria (an increase of 5.8 p.p.).

Housing affordability varies between different groups of society. Overall women were found to be more vulnerable to housing cost overburden than men in all, with the exception of the United Kingdom and Ireland. This trend is especially evident in Lithuania, where overburden rates were 3.4 p.p. higher for women than for men, as well as in Bulgaria, Greece, the Czech Republic and Germany where differences were greater than 2.5 p.p. Large differences have also been reported in Switzerland (3.3 p.p.).

No clear trend is apparent in terms of a person's age with regard to housing affordability; at EU-28 level the percentage of people whose housing costs exceeded 40% of their equalised disposable income was around 11.0% for people below the age of 18, 11.6% for people in the age of 18–64 and 10.0% for people over the age of 65. However, this is not the same in all EU Member States. In eleven Member States the elderly suffer more than the younger age groups in what regards housing cost affordability. The greatest difference in the housing cost overburden rate between the 18–64 age group and the elderly (over the age of 65) was reported in Bulgaria, Sweden and Denmark (which reported differences of 9.6, 7.1 and 6.4 p.p. respectively) and also in Switzerland (which reported a difference of 15.7 p.p.). On the other hand, the largest difference for those countries where the younger group (18–64) suffers more than the elderly (+65) was reported by Spain (11.6 p.p.) and Greece (10.3 p.p.) (Eurostat 2014a).

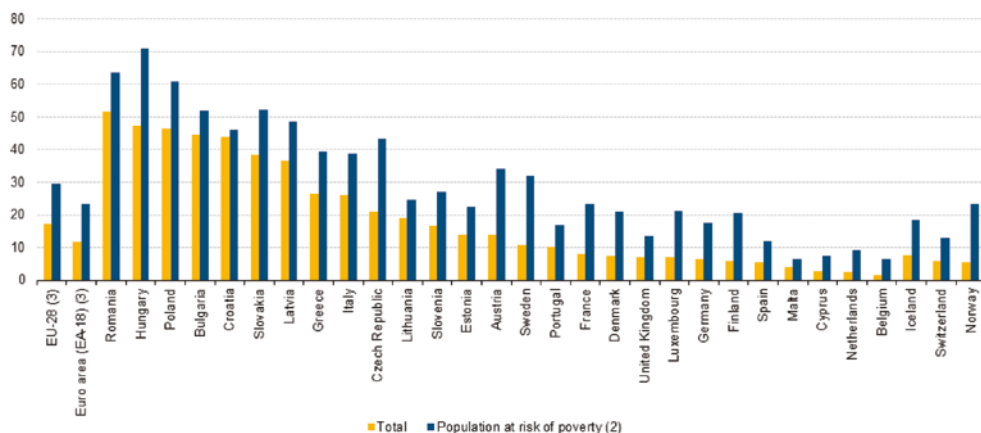
The proportion of the population whose housing costs exceeded 40% of their equalised disposable income was higher for owners with a mortgage or loan than those owners that had no outstanding mortgage or housing loan, with the exceptions of Belgium, Bulgaria, the Czech Republic, Greece, Lithuania, Finland and Sweden. The same exception holds for Switzerland. For tenants, higher overburden rates tend to apply to those tenants that pay their rent at the market price. The only exceptions here apply to Denmark and Sweden; however this finding should be treated with caution due to low reliability of the value for those renting at reduced price or free.

Dwellings rented at market price varied in size across Member States. In Romania, Lithuania and Latvia, rented dwellings at market price were relatively small (less than 50 m²), while in the Netherlands, Spain, Denmark, Belgium and Luxembourg, the usable floor in dwellings rented at market price exceeded 80 m², peaking at 100.2 m² in Cyprus. Tenants living in dwellings with a reduced price or free of charge had relatively more usable floor space at their disposal. The available floor space for tenants living in dwelling with a reduced

price or free of charge exceeded 100.0 m² in Sweden, Denmark, Cyprus, the Netherlands and Luxembourg (Eurostat 2014a).

One of the key dimensions in assessing the *quality of housing* conditions is the availability of sufficient space in the dwelling. The overcrowding rate describes the proportion of people living in an overcrowded dwelling, as defined by the number of rooms available to the household, the household's size, as well as its members' ages and their family situation.

In 2012, 17.2% of the EU-28 population lived in overcrowded dwellings (see Fig. 3.7); the highest overcrowding rates were registered in Romania (51.6%), Hungary (47.2%), Poland (46.3%), Bulgaria (44.5%) and Croatia (44.1%). By contrast, Belgium (1.6%), the Netherlands (2.5%) and Cyprus (2.8%) recorded the lowest rates of overcrowding, while eight other EU Member States (as well as Norway, Switzerland and Iceland) all reported less than 10.0% of their respective populations living in overcrowded housing. The largest increase between 2011 and 2012 in the share of the population living in overcrowded dwellings was reported by Austria (its share rising by 2.3 percentage points) (Eurostat 2014a).



Source: Eurostat (2014a)

Fig. 3.7. Overcrowding rate in the EU, 2012

In the EU as a whole and in more than half of the EU countries the overcrowding rate is higher if single person households are excluded from the computation of the indicator. On the other hand in Sweden, France, Denmark, Luxembourg, Germany, Finland, the Netherlands, Belgium as well as in Iceland, Switzerland, and Norway the exclusion of single-person households decreases the overcrowding rate (e.g. very small flats – studios are inhabited by one person). However,

in these countries overcrowding rates are relatively low (Eurostat 2014a).

Within the population at risk of poverty (in other words, people living in households where equalised disposable income per person was below 60% of the national median), the overcrowding rate in the EU-28 was 29.4% in 2012, some 12.2 percentage points above the rate for the whole population. The highest overcrowding rates among the population at risk of poverty were registered in Hungary (71.0%), Romania (63.7%) and Poland (60.8%), while more than half of all persons at risk of poverty in Slovakia and Bulgaria also lived in overcrowded housing. At the other end of the range, the lowest overcrowding rates for those at risk of poverty were recorded in the Netherlands (9.2%), Cyprus (7.5%), Malta (6.6%) and Belgium (6.4%); these were the only EU Member States to report that fewer than one in 10 persons at risk of poverty were living in overcrowded conditions (see Fig. 3.7).

Apart from the overcrowding rate, other measures, such as the size of the dwelling, can also provide a representative picture of housing quality, in terms of the availability of sufficient useful space in the dwelling. In 2012, the average size of the dwelling at EU-28 level was 102.3 m². The average useful floor area of a dwelling varied in size from 46.9 m² in Romania, 68.1 m² in Lithuania and 69.1 m² in Latvia up to 156.4 m² in Cyprus (Table 3.5).

Overall, in 2012, owners with a mortgage or loan lived in dwellings whose size was on average 124.5 m², while owners with no outstanding mortgage or housing loan had on average less living space at their disposal (105.2 m²). Among homeowners, this pattern is evident in the majority of Member States, except for Luxembourg, the Netherlands, France, Spain, Italy and Romania. The same exception holds for Iceland (Eurostat 2014a).

On the other hand, Europeans living in rented dwellings had, on average, less useful floor area at their disposal compared to homeowners. Europeans living in dwellings with a market price rent reported an average size of 78.6 m² for their dwelling, while those living in dwellings with a reduced price or free of charge reported an average size of 80.7 m².

Dwellings rented at market price varied in size across Member States. In Romania, Lithuania and Latvia, rented dwellings at market price were relatively small (less than 50 m²), while in the Netherlands, Spain, Denmark, Belgium and Luxembourg, the usable floor in dwellings rented at market price exceeded 80 m², peaking at 100.2 m² in Cyprus. Tenants living in dwellings with a reduced price or free of charge had relatively more usable floor space at their disposal. The available floor space for tenants living in dwelling with a reduced price or free of charge exceeded 100.0 m² in Sweden, Denmark, Cyprus, the Netherlands and Luxembourg (Eurostat 2014a).

In addition to overcrowding, some other aspects of *housing deprivation* – such as the lack of a bath or a toilet, a leaking roof in the dwelling, or a dwelling

Table 3.5. Size of the dwelling by tenure status

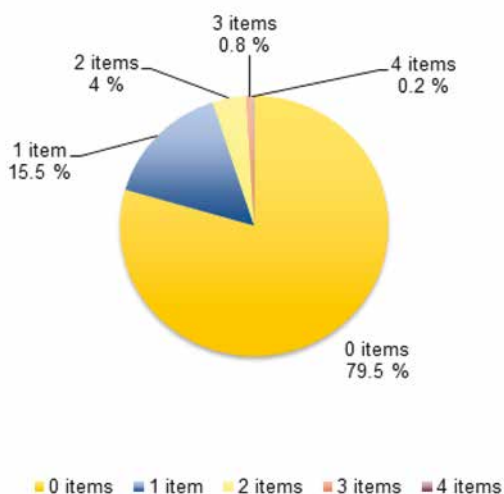
Country	Total population	Owner		Tenant	
		Owner without mortgage	Owner with mortgage	Tenant market price	Tenant reduced price or free
EU-281	102.3	105.2	124.5	78.6	80.7
Euro area (EA-18) ¹	104.8	113.5	123.1	78.3	84.0
Belgium	127.3	135.6	144.6	91.4	91.6
Bulgaria	76.6	78.7	84.2	59.5	61.7
Czech Republic	84.6	86.8	98.5	64.4	66.9
Denmark	132.1	152.9	157.7	87.1	134.7
Germany	106.8	128.9	135.1	76.8	82.4
Estonia	74.2	74.4	90.1	53.2	58.1
Ireland	84.2	86.7	100.5	64.9	60.2
Greece	94.0	97.8	104.2	77.0	81.0
Spain	102.8	107.3	104.7	85.5	96.6
France	101.8	116.4	1145.6	74.9	78.6
Croatia	89.0	90.3	93.6	61.7	80.3
Italy	98.7	104.8	103.5	78.6	86.0
Cyprus	156.4	167.1	191.5	100.2	119.5
Latvia	69.1	70.6	92.4	48.3	52.6
Lithuania	68.1	69.5	71.4	45.4	52.2
Luxemburg	144.1	165.2	159.5	96.3	116.6
Hungary	83.2	85.4	87.3	53.4	59.5
Malta ²	n/a	n/a	n/a	n/a	n/a
Netherlands	117.5	137.5	132.9	84.2	117.1
Austria	112.6	138.0	138.1	72.8	86.3
Poland	84.9	91.1	93.6	50.5	56.0
Portugal	112.2	116.8	128.0	79.5	86.2
Romania	46.9	47.3	46.7	33.5	35.7
Slovenia	89.2	94.8	100.6	53.3	74.1
Slovakia	93.6	95.4	101.8	68.0	77.1
Finland	104.0	111.9	122.7	63.3	64.5
Sweden	117.9	114.8	136.9	78.0	158.9
United Kingdom ²	n/a	n/a	n/a	n/a	n/a
Iceland	147.1	165.4	159.9	99.4	96.3
Norway	141.6	139.5	157.1	74.0	86.4
Switzerland	127.0	144.4	160.4	99.5	106.1

¹ Eurostat estimates; ² Unreliable data

Source: Eurostat (2014a)

considered as being too dark – are taken into account to build a more complete indicator of housing quality. The severe housing deprivation rate is defined as the proportion of persons living in a dwelling which is considered as being overcrowded, while having at the same time at least one of these aforementioned housing deprivation measures (Eurostat 2014a).

Housing quality can also be assessed by looking at other housing deficiencies, such as lack of certain basic sanitary facilities in the dwelling (such as a bath or shower or indoor flushing toilet), problems in the general condition of the dwelling (leaking roof or dwelling being too dark). In 2012 (see Fig. 3.8), 79.5% of the Europeans (EU-28 average) were declared as not deprived for the 'housing dimension', 15.5% were found to suffer from one of the dwelling problems, 4.0% suffered from two, 0.8% suffered from three and 0.2% suffered from all four of dwelling problems (i.e. leaking roof/damp walls/floors/foundation or rot in window frames and accommodation being too dark and no bath/shower and no indoor flushing toilet for sole use of the household) (Eurostat 2014a).



Source: Eurostat (2014a)

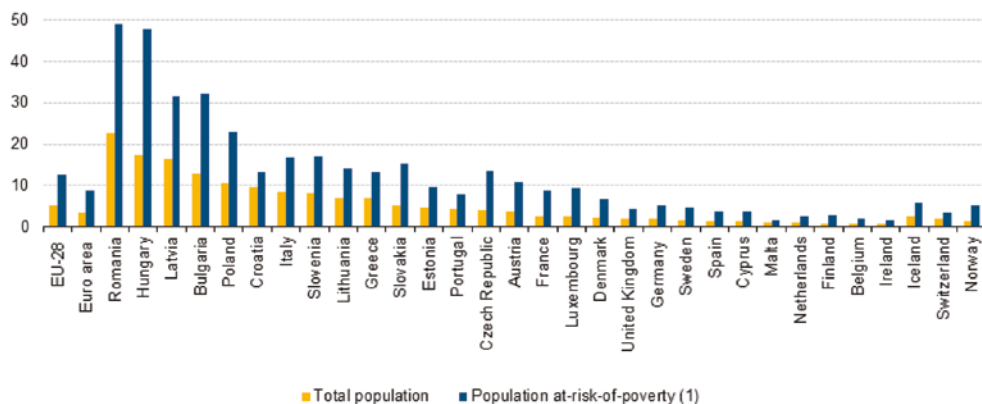
Fig. 3.8. Housing deprivation rate in EU-28, 2012

At the EU-level, the main housing problem was found to be a 'leaking roof' (i.e. leaking roof or damp walls, floors or foundation, or rot in window frames of floor) (15.1%), followed by 'darkness of the dwelling' (6.1%) while around 3.0% of the EU population lacked basic sanitary facilities (i.e. lack of bath/shower or indoor flushing toilet). Exceptions to this EU trend are Bulgaria, Lithuania and Romania, where sanitary problems were found to be more frequent than the other two housing problems mentioned above. In Sweden and the Netherlands, nobody was reported to be lacking indoor flushing toilet. At the other extreme,

about 36.2% of the people in Romania had no bath or shower, or no indoor flushing toilet (35.4% and 37.0%, respectively).

Overall, people at-risk-of poverty suffered more than the total population from these certain housing problems (or were deprived to a greater extent than the total population for the particular items). This was particularly the case in Romania, where the deficiency of basic sanitary facilities was found to be extremely common; 70.6% of the at-risk-of poverty population were found not to have a bath or shower and 71.6% did not have indoor flushing toilet. The situation is somewhat better, but still bad, in Bulgaria where 51.4% of the at-risk-of-poverty population were found to be lacking indoor flushing toilet and 38.4% of the at-risk-of-poverty population were found to be lacking a bath or shower. In Hungary, more than half of the at-risk-of-poverty population suffered from a “leaking roof” (Eurostat 2014a).

Insufficient spacing and poor amenities are those characteristics used to define severe housing deprivation. In 2012, the severe housing deprivation rate in the EU was 5.1% and it was more than double that figure (12.6 %) for the population that was at risk of poverty (Fig. 3.9). The highest rates for the total population were exhibited by Romania (22.8%), Hungary (17.2%) and Latvia (16.4%). The severe housing deprivation rate was below 1% of the total population in the Netherlands, Finland, Belgium and Ireland. In Romania and Hungary almost half of the population that was at-risk-of poverty faced severe housing deprivation (49.2% and 48.0%, respectively).



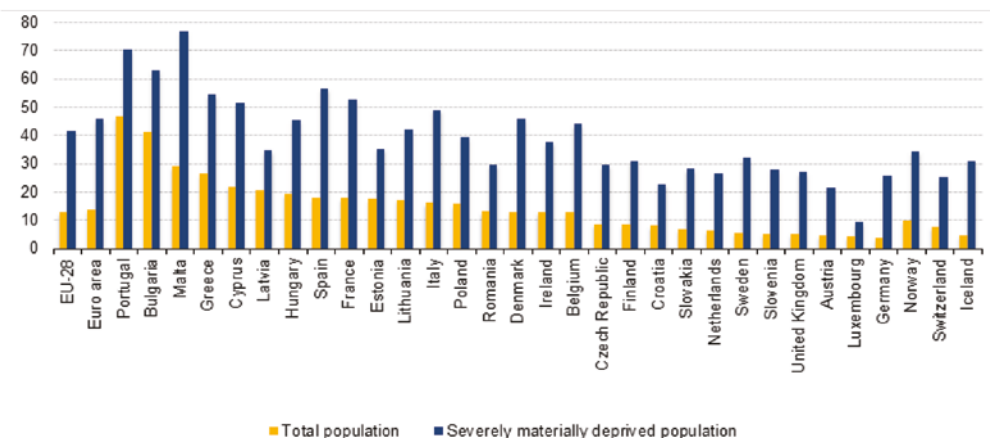
Source: Eurostat (2014a)

Fig. 3.9. Severe housing deprivation rate by poverty status

The severe housing deprivation rate was from 1.4 to 3.9 times (for the EU-28 it is 2.5 times) greater for the population at-risk-of poverty compared to the total population. The discrepancy is even larger in Norway, where the rate was found to be 4.3 times greater for the at-risk-of-poverty population (Eurostat 2014a).

In addition to objective measures of housing deprivation, indicators reflecting people's perceptions of the sufficiency of the facilities of their dwelling to satisfy the general needs of the household can also be used to assess housing deficiencies. Below we analyse self-reported measures of the efficiency of the dwelling equipment in terms of insulation and heating / cooling system.

On the other hand, almost 20.0% of the Europeans perceived the dwelling not sufficiently insulated against excessive heat during summer (Fig. 3.11); the share ranged from 3.3% in the United Kingdom, to at least 30.0% in Greece, Malta and Portugal, and peaking at 49.5% in Bulgaria (Eurostat 2014a).

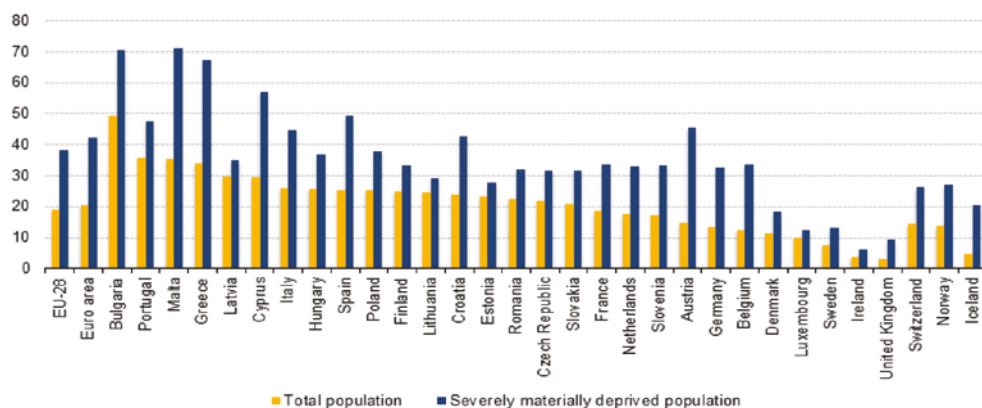


Source: Eurostat (2014a)

Fig. 3.10. Share of population living in a dwelling not comfortably warm during winter time by material deprivation status in the EU, 2012

In 2012, 12.9% of the EU-28 population declared that their dwelling was not comfortably warm during winter (Fig. 3.10). The share of the population living in a dwelling not comfortably warm during winter did not exceed 30.0% in all EU countries, except for Portugal (46.6%) and Bulgaria (41.1%) (Eurostat 2014a).

Overall, people assessed to be severely materially deprived were more likely to face heating and cooling problems in the dwelling during winter and summer than the total population reporting the same problems. This is particularly evident in Malta (Figs 3.10 and 3.11), where such problems were reported by a significant percentage of the population; 76.7% of the severely materially deprived population felt their dwelling insufficiently warm during winter and 71.3% of the same population declared that their dwelling was not comfortably cool during summer.



Source: Eurostat (2014a)

Fig. 3.11. Share of population living in a dwelling not comfortably cool during summer time by material deprivation status in the EU, 2012

Moreover, in Malta, Portugal, Bulgaria, Spain, Greece, France and Cyprus, more than half of the severely deprived population found the heating system unable to keep their dwelling adequately warm during winter; while more than two thirds of the population in Greece, Bulgaria and Malta perceived that the dwelling was not kept efficiently cool during summer (Eurostat 2014a).

Housing quality depends not only on the quality of the dwelling itself, but also on the wider *residential area*. In this case the indicators rely on the subjective opinion of the respondents, but have the advantage of drawing a more complete picture of housing.

In 2012, 18.8% of EU-28 population lived in a dwelling where noise from neighbours or from the street was perceived as a problem (Table 3.6). Almost 30.0% of people in Malta were concerned with noise, followed by Romania (27.1%), Germany (26.1%), Cyprus (25.7%) and Greece (25.1%). At the other extreme, the rates were lowest in Hungary (10.2%), Croatia (9.8%) and Ireland (9.0%). The same holds for Iceland (11.1%) and Norway (10.8%).

In 2012, 14.0% of the EU-28 population perceived the area in which they live as being affected by pollution, grime or other environmental problems. At the country level, the figures ranged from less than 10% in Finland, the United Kingdom, Spain, Sweden, Croatia, Denmark and Ireland to almost 40.0% in Malta. Rates were also small in Switzerland (10.0%), Norway (9.6%) and Iceland (8.5%).

Crime and/or vandalism were perceived as a problem by 13.6% of the EU-28 population in 2012. At the country level, the rates were highest in Bulgaria (26.9%) and Greece (20.1%), while only 3.3% of the population in Croatia and

Table 3.6. Proportion of the population suffering from problems in the residential area, 2012

Country	Noise		Pollution, grime and other environmental problems		Crime, violence or vandalism	
	Total population	Population at-risk-of-poverty	Total population	Population at-risk-of-poverty	Total population	Population at-risk-of-poverty
EU-28	18.8	22.1	14.	15.1	13.6	16.3
Euro area	19.8	23.9	15.6	17.4	13.4	16.0
Belgium	17.0	22.3	15.3	20.5	14.7	22.5
Bulgaria	12.0	15.1	15.0	18.2	26.9	25.9
Czech Republic	14.3	15.8	15.5	16.3	13.2	14.3
Denmark	17.5	27.3	5.7	7.2	10.3	12.4
Germany	26.1	33.6	22.4	25.7	12.5	18.6
Estonia	12.8	15.0	11.9	11.5	15.7	17.5
Ireland	9.0	8.2	4.8	3.5	10.7	12.1
Greece	25.1	23.5	25.9	25.5	20.1	18.4
Spain	15.0	16.5	8.0	8.4	10.1	11.4
France	17.0	23.7	11.3	13.7	14.7	18.8
Croatia	9.8	9.4	7.1	7.1	3.3	3.7
Italy	17.7	20.7	17.1	19.3	14.7	15.8
Cyprus	25.7	21.1	15.5	11.7	15.5	12.8
Latvia	15.4	15.2	22.0	21.4	17.0	15.5
Lithuania	13.3	14.1	14.6	11.8	5.0	4.9
Luxemburg	17.0	26.6	14.0	19.9	14.4	15.7
Hungary	10.2	14.7	11.8	12.6	10.3	17.7
Malta	29.7	26.6	39.6	37.2	12.6	10.5
Netherlands	24.2	37.9	14.0	17.5	18.3	21.9
Austria	19.5	21.6	10.8	9.8	11.7	10.2
Poland	14.2	13.3	11.0	9.5	6.3	7.3
Portugal	23.8	23.9	14.9	13.3	10.9	7.9
Romania	27.1	19.8	17.6	13.2	13.7	12.8
Slovenia	13.8	13.8	16.0	15.0	8.1	7.3
Slovakia	16.0	15.1	15.1	16.9	9.6	9.4
Finland	14.2	18.6	8.8	8.8	8.6	12.8
Sweden	12.9	16.7	7.6	8.5	9.7	14.4
United Kingdom	18.2	23.1	8.3	9.3	19.7	26.4
Iceland	11.1	17.2	8.5	7.4	3.4	6.8
Norway	10.8	15.4	9.6	10.3	6.0	9.3
Switzerland	18.7	20.1	10.0	12.9	16.5	17.3

Source: Eurostat (2014a)

5.0% in Lithuania considered this to be a problem. Rates were also low for Iceland (3.4%) and Norway (6.0%).

Additionally, access of basic services is another important determinant for assessing housing quality in the residential area. Accessibility to basic facilities in the residential area, such as public transport and health care services, refers to the ability of households to obtain the services they need.

In 2012, the share of the EU-28 population considering that primary health care services could be accessed with some or great difficulty peaked at 26.1% in thinly populated areas of the EU, which was considerably higher than the respective shares recorded for either intermediate density areas (17.4%) or densely populated areas (11.8%).

This pattern was common across all EU Member States in 2012, although there were some exceptions. In Croatia, the highest share of the population reporting some or great difficulty in accessing primary health care services was recorded for intermediate density areas (Eurostat 2014a).

By contrast, the largest differences between the population having some or great difficulty in accessing primary health care services in thinly and densely populated areas, were recorded in Poland, the Czech Republic and Greece, where thinly populated areas recorded a share that was over 25 p.p. higher than for densely populated areas.

Slightly less than 40.0% of the EU-28 population in thinly populated areas considered that there was some or great difficulty in accessing transport services in 2012, with this share ranging from 13.4% in Hungary to 71.2% in Belgium. On the other hand, the same share for intermediate density areas was 15.1 p.p. (22.4%) lower than for thinly populated areas.

In all Member States, the proportion of the population reporting some or great difficulty in accessing public transport was lower (an average of 9.7% across the whole of the EU-28) for densely population areas than the other area types. Exceptions to this trend are Cyprus, Portugal, Latvia and Lithuania (Table 3.7).

Finally, differences between the population having some or great difficulty in accessing transport services in thinly and densely populated areas exceeded 40.0% in Belgium, Germany, Ireland and Finland (Eurostat 2014a).

Overall, 89.3% of Europeans in 2012 felt (very) *satisfied* with the dwelling they lived in. Subjective assessments of Europeans of the degree of their satisfaction with the dwelling were based on a number of factors considered important for meeting household needs, such as the price, space and quality of the dwelling, distance from home to work, etc.

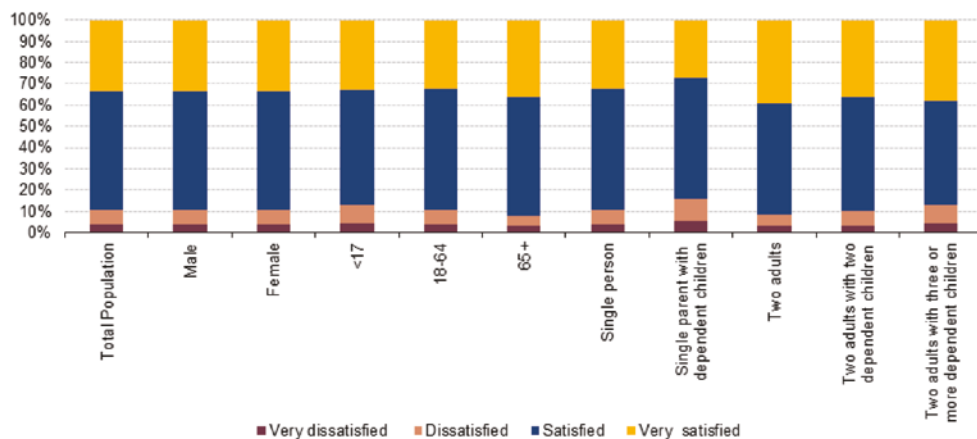
Table 3.7. Share of population reporting great or some difficulty in accessing primary health care and public transport services by degree of urbanisation, 2012

Country	Access to primary health care services			Access in public transport services		
	Densely	Intermediate	Thinly	Densely	Intermediate	Thinly
EU-28 ¹	11.8	17.4	26.1	9.7	22.4	37.5
Euro area ¹	11.4	17.3	21.6	10.1	25.0	39.6
Belgium	7.4	13.4	31.4	8.5	26.4	71.2
Bulgaria	26.2	24.1	34.7	18.6	20.0	33.0
Czech Republic	8.8	13.0	38.0	3.5	10.2	29.0
Denmark	10.7	14.4	19.1	7.4	18.7	28.6
Germany	7.8	11.6	22.8	4.6	24.4	50.1
Estonia	13.6	13.9	34.6	5.9	16.7	37.2
Ireland	9.6	9.3	31.2	5.8	14.7	48.6
Greece	12.4	18.4	39.3	6.7	11.5	34.5
Spain	9.1	15.6	20.2	6.7	12.0	20.7
France	4.9	6.3	7.3	9.5	16.6	26.9
Croatia	14.4	38.6	32.5	11.1	39.6	40.4
Italy	24.4	35.1	39.4	22.0	36.3	38.3
Cyprus	9.1	13.6	15.1	14.1	12.4	15.9
Latvia	31.0	18.4	36.0	9.6	8.6	27.1
Lithuania	12.6	8.3	34.0	9.1	7.6	31.7
Luxemburg	8.2	9.4	13.3	4.2	7.8	13.5
Hungary	14.0	15.4	13.5	9.9	14.5	13.4
Malta	24.6	32.4	n/a	24.8	20.5	n/a
Netherlands	5.1	5.2	7.7	7.5	20.9	35.5
Austria	9.9	11.7	20.4	4.8	13.2	36.7
Poland	15.3	23.5	46.3	7.6	18.4	43.2
Portugal	15.0	10.3	23.9	11.1	9.2	23.3
Romania	27.0	33.9	50.2	12.8	25.5	32.8
Slovenia	14.3	17.8	25.7	7.4	22.3	35.4
Slovakia	21.6	29.7	39.0	6.0	16.3	20.9
Finland	19.4	20.8	21.2	7.7	19.2	47.8
Sweden	8.0	11.3	12.4	3.5	9.7	23.0
United Kingdom	8.5	10.7	14.7	8.5	16.1	45.2
Iceland	6.5	n/a	16.1	14.0	n/a	27.5
Norway	10.5	10.8	14.3	17.1	33.5	49.4
Switzerland	9.1	13.5	29.5	3.3	9.4	23.3

¹ Eurostat estimates for 'Thinly' category

Source: Eurostat (2014a)

Figure 3.12 explores the relation of some socio-demographic characteristics (sex, age, and household composition) with the degree of satisfaction of with the dwelling. Evidently sex is not a factor that is related to the degree that the person feels satisfied with the dwelling, since percentages for both males and females are similar (Eurostat 2014a).



Source: Eurostat (2014a)

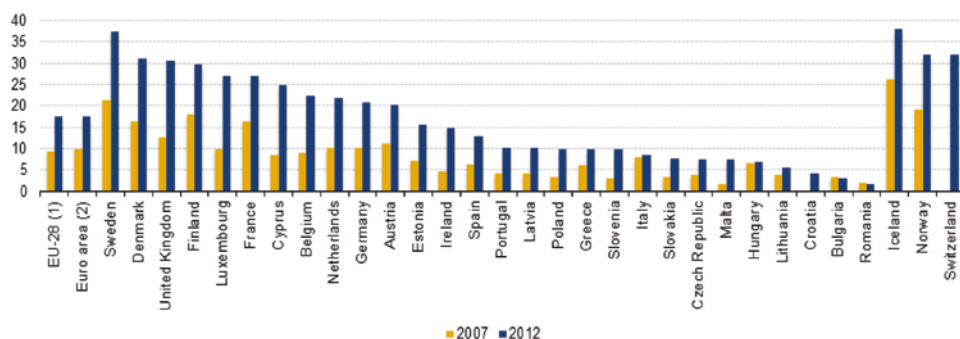
Fig. 3.12. Overall satisfaction with the dwelling by socio-demographic characteristics (sex, age and household type) in EU-28, 2012

Regarding the age dimension, the differences between the three age groups (less than 17 years old, 18 to 64 years old and over than 65 years old) are small, however respondents aged 65 and over felt very satisfied with their dwelling at a higher frequency than respondents in the two other age groups. Differences are as high as 3.0 p.p. between the population aged 65 and over and the population less than 17 years, and 3.6 p.p. between the population aged over 65 years and the younger age group (Eurostat 2014a).

The degree of satisfaction with the dwelling seems to be also affected by the household composition. Single parents with dependent children reported the highest percentage of dissatisfaction with their dwelling (16.0%) compared with households with two adults with or without dependent children (Eurostat 2014a).

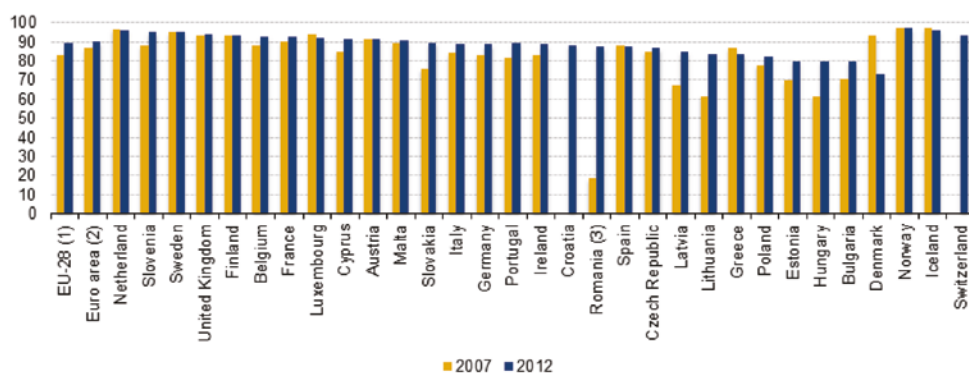
Although the majority of Europeans felt (very) satisfied with their dwelling in 2012, slightly more than one in six persons reported that has changed dwelling during the last five years (Fig. 3.13). At country level, the highest percentage of population having changed dwelling within a five-year period was recorded in Sweden (37.6%), followed by Denmark (31.3%) and the United Kingdom

(30.8%). Between 2007 and 2012, the percentage of population that moved to other dwelling increased by 8.4 p.p. The largest differences were recorded in the United Kingdom (18.1 p.p.), Luxembourg (17.4 p.p.), Cyprus (16.6 p.p.) and Sweden (16.3 p.p.). Only Romania and Bulgaria reported decreases in their respective percentages (a decrease of 0.3 and 0.2 p.p., respectively) (Eurostat 2014a).



Source: Eurostat (2014a)

Fig. 3.13. Share of population having moved to other dwelling within the last five year period (2007–2012)



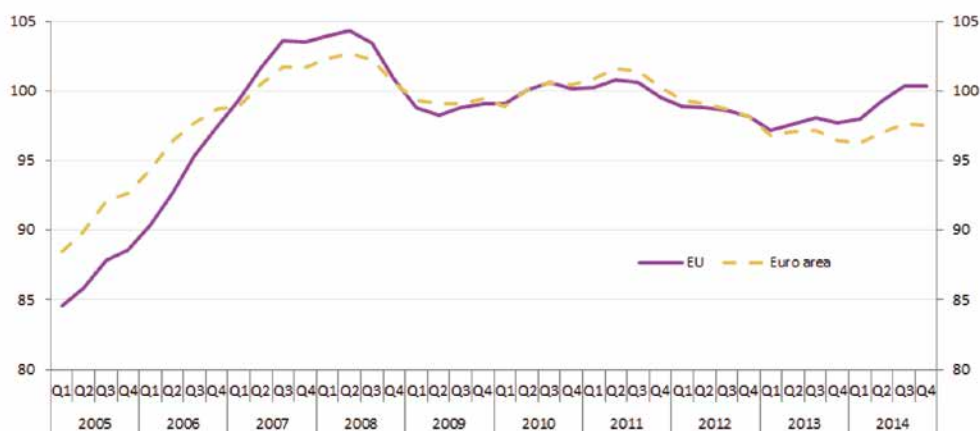
Source: Eurostat (2014a)

Fig. 3.14. Share of population reporting satisfied or very satisfied with the dwelling, (2007–2012)

Overall, the percentage of population feeling satisfied or very satisfied with the dwelling increased in 2012 compared to 2007 (Fig. 3.14). Between 2007 and 2012, the proportion of population declaring (very) satisfied with the dwelling increased by at least 15 p.p. in Latvia, Hungary, Lithuania and Romania,

although for the latter this could be due to the reported difference in the wording of the question in 2007. In total, six countries reported decreases between 2007 and 2012, ranging from 0.1 p.p. in Sweden to 19.9 p.p. in Denmark. The same holds for Norway and Iceland.

The House price index (HPI) shows the price changes of residential properties purchased by households (flats, detached houses, terraced houses, etc.), both newly-built and existing ones, independently of their final use and independently of their previous owners. The Member States' HPIs are compiled by the national statistical institutes, while Eurostat calculates the euro area and EU HPIs (Eurostat 2014b). The index levels (2010 = 100) for the euro area aggregate and EU aggregate house price indices are shown in Figure 3.15.

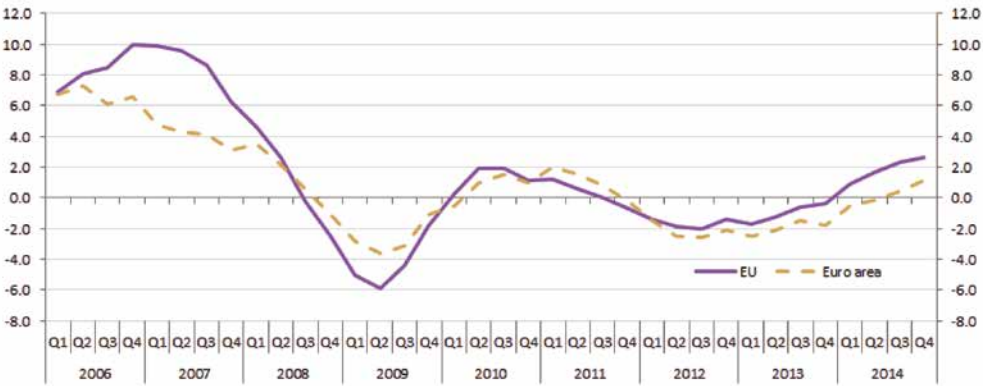


Source: Eurostat (2014b)

Fig. 3.15. House price indices – euro area and EU aggregates; index levels (2010 = 100), 2014Q4

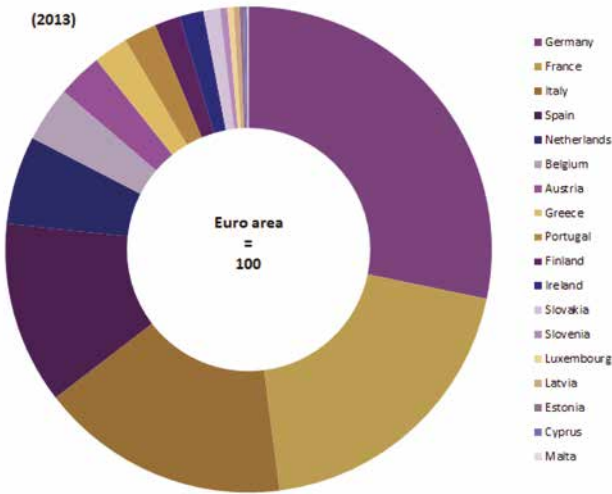
The annual growth rate of the euro area and EU HPIs is presented in Figure 3.16. Looking at the entire period, the annual growth rate of the euro area house price index reached a maximum of 10.0% in the fourth quarter of 2006, and a minimum in the second quarter of 2009, with -5.9%.

HPIs are computed as Laspeyres-type annual chain indices allowing weights to be changed each year. The European Union HPIs are calculated as weighted averages of the national HPIs, currently using as weights the GDP at market prices (based on PPS) of the countries concerned. The weights used in 2014 are based on data for the preceding year (2013) (Eurostat 2014b). These weights are illustrated in Figure 3.17 for the euro area.



Source: Eurostat (2014b)

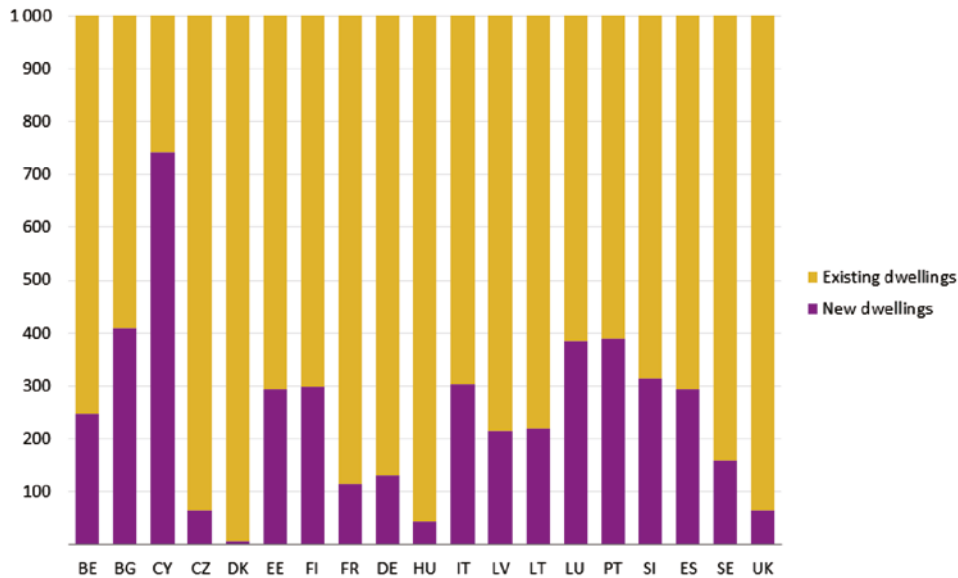
Fig. 3.16. House price indices – euro area and EU aggregates; annual growth rate, 2014Q4



Source: Eurostat (2014b)

Fig. 3.17. Weights of Member States in the euro area HPI aggregate, 2013

As of December 2014, in addition to the price index for total dwellings transacted in the market, Eurostat publishes separate indices for newly built and existing dwellings. The separation of dwellings into newly built and existing is relevant due to their often different price evolutions (Fig. 3.18). From the figure one can see that the European housing sector is dominated by old dwellings and only few new dwellings are built each year.



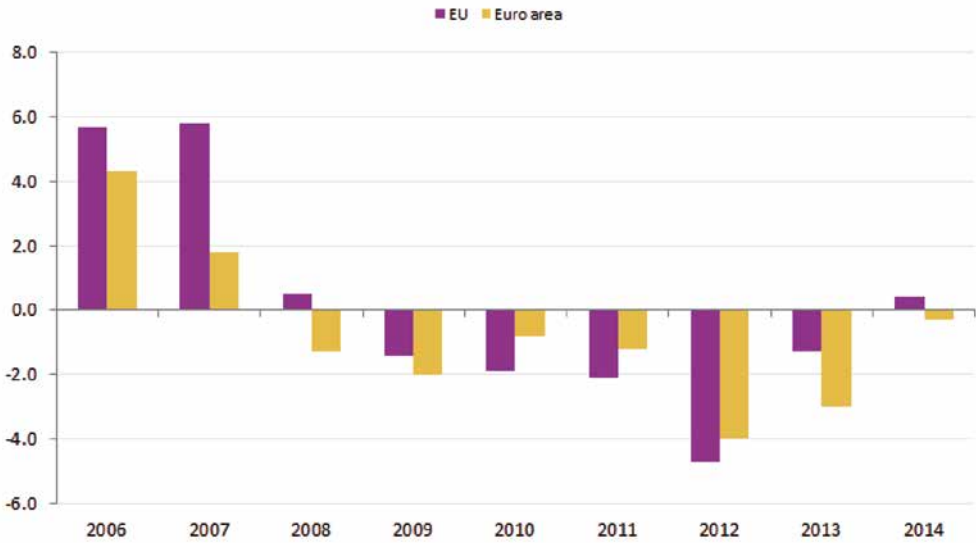
Source: Eurostat (2014b)

Fig. 3.18. Weights of new and existing dwellings in total dwellings, for 2013 indices (total dwellings = 1000)



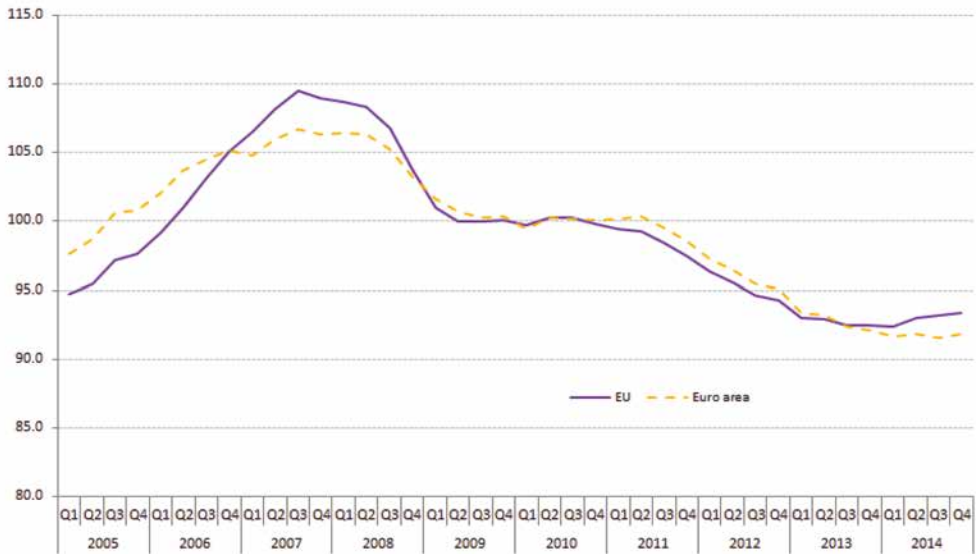
Source: Eurostat (2014b)

Fig. 3.19. Deflated house price index euro area and EU aggregates; index levels (2010 = 100) – 2014Q4



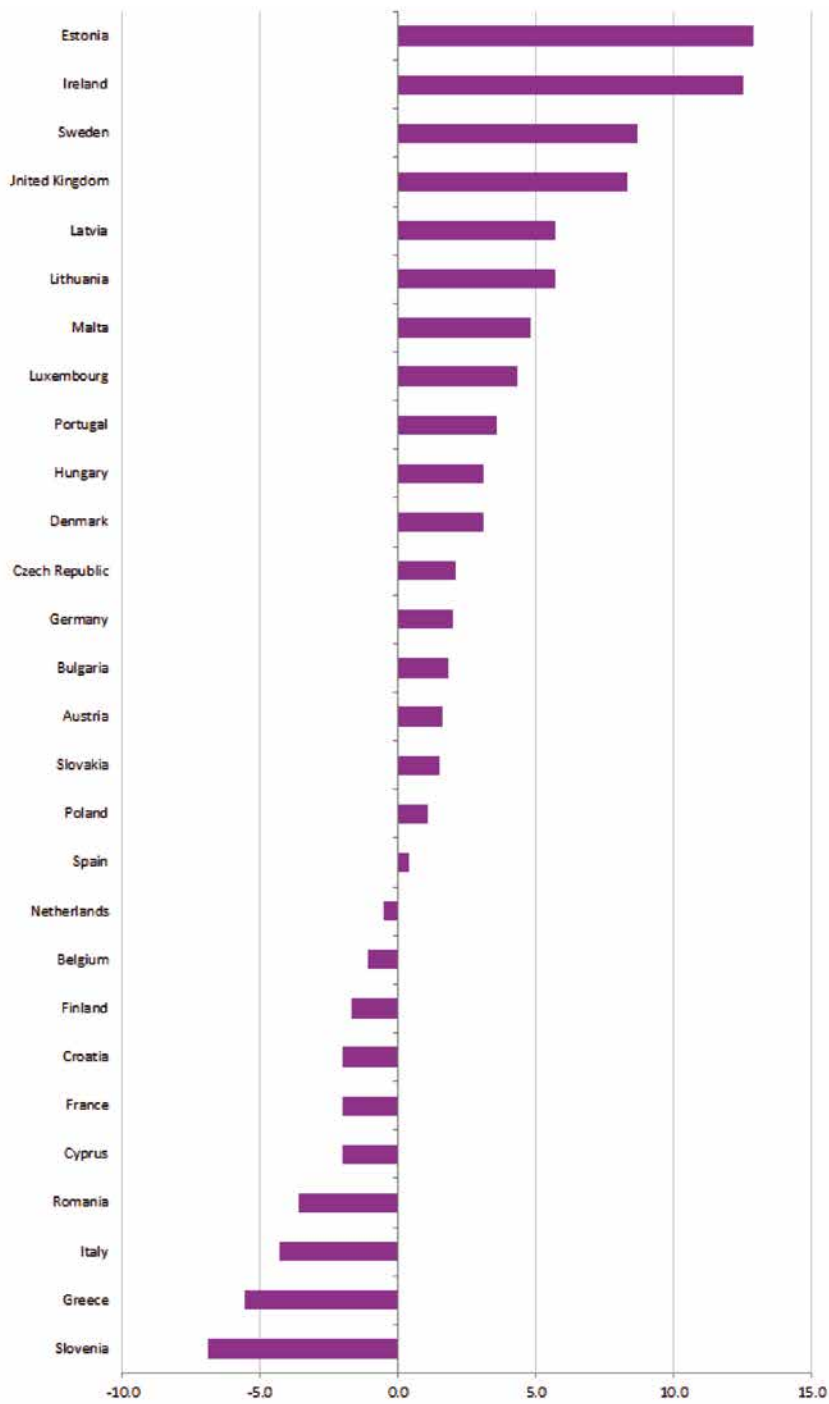
Source: Eurostat (2014b)

Fig. 3.20. Annual deflated HPI – rate of change %, 2014



Source: Eurostat (2014b)

Fig. 3.21. Ratio of house price index to HICP for actual rents – index levels (2010 = 100), 2014Q4



Source: Eurostat (2014b)

Fig. 3.22. Annual deflated HPI by Member State – rate of change % – EU, 2014

The deflated HPI is the ratio between the nominal HPI and an index of consumer price inflation. A consumer price index, such as the HICP, or a national accounts final consumption deflator can be used for stripping out consumer prices inflation from the HPI. The deflated HPI included in the MIP Scoreboard uses the national accounts final consumption deflator. The deflated HPI growth rate is a key variable for the analysis of house price cycles. In particular, a too high growth rate is considered an early warning indicator of tensions in the real estate market signalling the risk of price bubbles. The alarm threshold adopted in the context of the MIP is 6% of annual growth rate in the deflated HPI. The level of the threshold was established by DG ECFIN in cooperation with central banks. It was set on the basis of an analysis of historical data on past boom and bust cycles of house prices (Eurostat 2014b). The deflated HPI for the euro area and the EU is presented in Figures 3.19 (quarterly index) and 3.20 (annual rate of change).

In order to put house price dynamics into perspective, analysts have developed other indicators that combine the HPI with, for example, the price index of rents, in the form of a price on earnings ratio, or measure affordability using price-to-per capita disposable income of households. Quarterly price to rent index ratios are shown in Figure 3.21 for the euro area and the EU, using Eurostat data for the HPI and Eurostat HICP for the category actual rents.

Figure 3.22 illustrates well the magnitude of the differences among countries in the annual rate of change, for the year 2013. From the provided information one can see that in 2013 in 18 EU countries, the highest increase was observed in Estonia, Ireland, Sweden, United Kingdom, Latvia and Lithuania. All these countries had prices bubbles in residential market till 2008 and later suffered from financial crisis. Current increase in prices indicates that real estate markets finally recovered and started to grow.

Decrease in residential housing prices observed in 10 EU countries. Highest decrease is documented in Slovenia, Greece, Italy and Romania.

3.6.2. Housing Policy and Conditions in Lithuania

Since the fall of communist regimes, housing policy in Central and Eastern Europe (CEE) has experienced dramatic changes. Studies (e.g. Tsenkova 2009) have already documented a rapid state's withdrawal from the direct intervention in the housing sector and residualisation of public housing and urban policies in many CEE countries. Before the fall of various communist regimes in 1989–1991, former communist countries, despite some variation in the national context, had “highly centralised housing systems and comprehensive state control over the production, allocation and consumption of housing”. The communist housing system has been characterised by a large-scale construction of the state and state-sponsored housing in a high rise, low housing cost, the state's heavily

subsidized and uniform prices of dwellings and the chronic housing shortage resulting in long waiting lists (Tsenkova 2009). Since the fall of the communist regime, the major problem has been liberalisation of housing and urban policies allowing market forces to take almost full responsibility for it (Balchin 1996). One of the most important measures that were meant to ensure a rapid return to a market economy and 'western' democracy was the implementation of housing privatization (Aidukaite 2014).

However, the scale of housing privatisation, often recommended by such international organizations as the World Bank and the International Monetary Fund, has varied in individual countries. Large-scale privatisation took place in such countries as Lithuania, Estonia and Romania. However, in Poland and the Czech Republic the scale and pace of privatisation were much more modest. Bulgaria was a special example, since home ownership was already promoted during the communist era. Large-scale privatization was mainly implemented through the application of the existing tenants' right to buy at a discount. In such countries as Poland and the Czech Republic home ownership was also encouraged through the process of restitution (Balchin 1996; Lux 2003). Lithuania is one of the CEE countries that privatised more than 93% of its total stock of dwellings – mainly by selling the state housing to the tenants (Aidukaite 2014).

Some studies have already documented the negative consequences of privatisation and liberalisation in the CEE. The adoption of a liberal approach towards housing and urban policy has been accompanied by problems including lack of social housing, increasing housing inequalities, gentrification, inadequate state policies and legislation, policies in favour of the new construction, lack of experience in public–private partnerships, problems in maintenance and repair of the private stock (Tsenkova 2009; Polanska 2011).

Although, the CEE countries have varied in scale and speed of housing reforms, it is possible to observe a common pattern for all countries. Studies (Balchin 1996; Hegedus, Teller 2005; Tsenkova 2009) indicate that housing systems in CEE have moved closer towards the liberal welfare regime, which means that the significance of the state (public housing) is decreasing, the safety net puts more and more burden on families and the state provides help only to the neediest families (very low-income households and in critical situations) (Hegedus, Teller 2005) (cited from Aidukaite 2014).

In his examination of housing systems in Hungary, the Czech Republic and Poland, Balchin (1996) has stated that as far as housing is concerned, it is evident that in these countries the liberal welfare state regime is emerging and there is little evidence of an integrated rental system being developed. The evidence of the liberal regime is found in the substantial reductions in state-funded housing investment with an increased reliance on private finance to expand owner-occupation, with rents rising to market levels, with housing management

being transferred from central government organizations to private agencies, and with massive programs of privatization depleting the public-rental stock. Moreover, Tsenkova (2009) has explored housing reforms and housing systems' performance in nine countries of South East Europe (Albania, Bulgaria, Bosnia and Herzegovina, Croatia, Former Yugoslavia Republic of Macedonia, Romania, Republic of Moldova, Serbia and Montenegro with a reference to Kosovo/UN-MIK). Her study shows that housing conditions were different in the beginning of the transition and some countries have implemented more comprehensive reforms in major housing areas, which have increased the differences (Aidukaite 2014).

However, in all countries the role of the state in production, allocation and operation of housing has been reduced. Specifically, the shift in the form of the state intervention in housing has been the elimination of price controls, restructuring the housing subsidy system and privatization of the housing stock. Housing privatisation has been applied across the region and this brought a significant increase in the assets of private ownership. It boosted private investments in the housing markets. However, due to lack of effective organizational, financial and legal measures for its management, it resulted in deterioration of the multi-apartment housing in urban areas. This problem has also been observed in other post-communist countries (see e.g. Ruoppila's 2005 study on Estonia). Deterioration of the old multi-apartment blocks which need a substantial renovation is still a significant problem in Lithuania (e.g. see Leonavičius, Žilys 2009).

The Lithuanian case displays all issues of the post-communist housing policy and urban development. One of the most important changes in Lithuania was a massive privatisation of the housing stock. At present, as noted, 97.2% of the dwellings in Lithuania are occupied by their owners and only 2.8% accounted for public and municipal property (Statistics Lithuania 2015). The majority of Lithuanian residents (66%) live in apartment blocks built in 1961–1990. The publicly owned rental housing stock was quickly privatised. However, the legal and institutional system of taking care of maintenance and repair of private apartment blocks was not created sufficiently. At present, the Lithuanian housing policy suffers from a shortage of affordable housing for low-income families, low quality of housing estates (especially those that were built before 1989) and lack of the sustainable housing management system and housing policy institutions.

Nevertheless, a significant physical problem of all major cities is related to energy: inefficient apartment blocks and old not renovated public buildings. In many cases, the heating cost of such public buildings during the winter season is at least twice as high as in Western Europe. As a result, one of the key priorities in the Lithuania Single Programming Document for the EU structural funds is the provision of funds for the renovation of public buildings in order to improve their heating efficiency (Petkevicius 2005).

In order to understand changes in the housing system of Lithuania, one needs to explore Soviet legacies. After the Second World War, Lithuania was incorporated into the Soviet Union and was a subject to the same socialist housing and urban planning regulations as the whole USSR. One of the most important features of socialist housing and urban policies was rapid urbanisation (Aidukaite 2014).

During Soviet times, Lithuanian society has become urbanised: in 1970s urban population accounted for 50% (Leonavičius, Žilys 2009), while before Lithuania was incorporated into the Soviet Union, it was mainly an agrarian society with its 76% of the population living in a countryside (Aidukaite *et al.* 2012). Urbanisation was particularly intense during the period of 1960–1980, which was accompanied by rapid industrialisation and labour force movement from rural to urban areas (Jasaitis 2012).

At present, about 66% of the population live in urban and 33.1% in rural areas (Statistics Lithuania 2015). During Soviet times, one of the top housing policy priorities in Eastern Europe was to ensure that class differences or rather income and status differences were not reflected in housing allocation (Pichler-Milanovich 1997). Although social polarization and residential segregation were not completely abolished, since the elite's districts were also built during Soviet times, this policy reflected in the increased equality as regard to the housing and various strata of society lived close to each other. Apartment blocks built with the panel technology were a clear expression of Soviet ideology seeking to erase social and class differences: an ordinary labourer lived in the same type of apartment as a professor (Gerdvilis 2007). Some other features were also observable such as evenly and well established infrastructure in separate neighbourhoods of the city as well as well-developed public transportation.

However, housing shortage was a common feature of Soviet economy and this resulted in fast, but poor quality housing construction, which sought to meet increasing housing demands (Leonavičius, Žilys 2009).

The disintegration of the Soviet Union and subsequently the privatisation of the economy have brought new problems into the ordinary people's lives.

According to Pichler-Milanovich (1997), the transition from planned to market economy has involved great practical difficulties and enormous hardship for many people. Currently Lithuania is among the EU countries, which spend least on social protection, have the highest poverty and unemployment rates (Aidukaite 2011), and highest outward labour migration (Aidukaite, Genelyte 2012; Ainsaar, Stankuniene 2011).

Yet ageing of the population is also a remarkable problem in Lithuania. The negative social and demographic developments reflect on housing and urban policies. After the collapse of the Soviet Union, rapid depopulation and deindustrialization of Lithuanian society has created a situation where in the city statistically

each year residents have more and more useful floor area (Leonavičius, Žilys 2009). The average useful floor area per capita in 2014 amounted to 30.1 m², in urban areas – 28.3 m², in rural areas – 33.8 m². The useful floor area per capita in Vilnius city amounted to 41.1 m² (Statistics Lithuania 2015).

Leonavičius and Žilys (2009), however, predict that while maintaining such social and demographic trends (increasing emigration and depopulation due to rapid ageing and low fertility rates) there will not be a “mass production” of housing in Lithuania in the future. Instead, the Lithuanian state's and business's interests will be concerned with the maintenance of the existing housing stocks ensuring their quality and meeting the housing needs of different social groups. Meeting the needs of young families which have better opportunities to take a mortgage for the longest period of time will be at the centre of housing policy in the years to come (Aidukaite 2014).

The replacement rate of the old-age pension is maintained at low levels and accounts for only 30–40% of the gross average wage in Lithuania (Muller 2002). This is low by Western European standards. The situation is similar with other benefits, such as unemployment and social assistance (Aidukaite 2014). In the housing field, as noted, de-commodification can be measured by the generosity of income support schemes (pensions, unemployment benefits, social assistance) – especially those that involve the field of housing – and by the proportion of social housing. The Lithuanian government provides some housing allowances on a means-tested basis. These are compensations for heating and hot and cold water expenses as partial reimbursement for dwelling maintenance.

The numbers of those who claim these benefits have been increasing each year (Mikniūtė 2013). This is due to the constant price increase for heating and other dwelling maintenance expenses. However, in Lithuania, the qualifying conditions to receive social assistance benefits are strict. To qualify for means-tested benefits the claimant has to pass not only the income but also property and assets tests. To stimulate home ownership, the state provides small subsidies (10–20%) to repay part of the housing loan, which is granted to young families raising one or more children (adopted children), to families where one of the parents died, to orphans who have reached the age of majority but are younger than 35, families raising three or more children (adopted children), persons recognized as incapable or partly capable to work and families with a disabled member (Aidukaite 2014).

However, there were only 23 persons (families) who received these kinds of subsidies in 2010; in 2012 there were 80 persons (families). These figures are very low given high poverty rate in Lithuania and relatively low minimum wage compared to the other EU countries (Aidukaite 2014).

Among the 22 member states that have national minimum wages, Eurostat (2015) has divided them into three main groups. In January 2015, ten countries

had minimum wages below EUR 500 per month: Bulgaria (EUR 184), Romania (EUR 218), Lithuania (EUR 300), the Czech Republic (EUR 332), Hungary (EUR 333), Latvia (EUR 360), Slovakia (EUR 380), Estonia (EUR 390), Croatia (EUR 396) and Poland (EUR 410) (EurActive 2015). One can observe that Lithuania is in the third place among these countries.

One of the priorities of the Lithuanian housing strategy is to increase social housing, which, according to European standards, is very modest. However, so far, the demand for social housing is exceeding the supply and the waiting list to receive it is increasing each year (Mikniūtė 2013). Social housing is directed to the poor households only and distributed on a means-test basis in Lithuania. Young families, orphans and children without parental custody, disabled persons and families raising three or more children are on the waiting list. There were only 946 families who have rented social housing provided by the municipalities in 2011. These are very low figures for the whole Lithuania. Studies (Jurevičienė 2007; Tsenkova, Turner 2004) have already shown that the social housing has decreased in many CEE countries. However, some countries, such as Russia, the Czech Republic and Poland have retained a significant part of the social housing (Aidukaite 2014).

Hence, one might assume that de-commodification of housing is low in Lithuania if we measure it by the generosity of social benefits and the share of social housing. However, as noted, in Lithuania home ownership is very high; many benefited from privatisation and bought their dwellings at a very low price using vouchers. This might break a link between income and housing consumption (Aidukaite 2014). Study of Bložienė (2013) shows that the majority (85%) of Lithuanian residents do not intend to buy or sell their real estate; while those who plan to purchase a flat or house make up only 13%. Yet, 65% of them (those who plan to buy a dwelling) intend to purchase homes with their own resources, not with long-term mortgage loans. As a result, the housing market remains largely unindebted and rarely traded in Lithuania unlike in the liberal housing regime. Thus, it is possible to state that decomodification is relatively high for those who acquired their homes during massive privatisation. However, it is low for those who have to buy or rent a home for the market price (Aidukaite 2014).

The privatisation has produced inequalities among generations. In Lithuania, young people leaving their parents' home have to buy a dwelling for the market price while their parents received it at a very low price. This situation is very unfavourable for young people. An affordable municipal housing market in Lithuania has not been developed and to buy and own private housing is a very big investment for the young people (Aidukaite 2014).

This could be one reason which encourages emigration from Lithuania. Studies show that about 40% of young people are financially supported by their

parents. Many of them rely on their parents' help in obtaining (renting or buying) their first home. This also shows that stratification has been increasing in Lithuania between those who are able to buy a new home and those who cannot get a loan from the bank. The Eurostat data (2014) shows that in 2012 only 6.7% of households in Lithuania have owned their housing with the mortgage loan, while for Sweden this figure is 65.9%; for the UK – 41.9%. For a comparative purpose it may also be noted that in such post communist countries as Estonia and the Czech Republic, there are more households owning their housing with the mortgage loan. The figures for the Czech Republic are 18.1%, for the Estonia – 16.7%.

Since 1993, the construction sector is dominated by private builders. Currently, housing construction companies try to attract customers even before the construction begins.

Smaller construction companies carry out repairs and reconstruction of the existing dwellings (Zavadskas *et al.* 2002). The state's role in the housing policy field is minimal. The Ministry of Environment is responsible for the state's housing policy development and its implementation. The Ministry instructs on housing construction, reconstruction and renovation. Some specific housing issues (subsidization, social housing and housing benefits) are dealt with by the Ministry of Finance, the Ministry of Internal Affairs and the Ministry of Social Security and Labour. Municipalities (local governments) manage the housing needs of individuals, distribute the social assistance benefits and decide on the award of social housing. Local municipalities also manage land rental and sales issues and the issues of housing construction permits (Zavadskas *et al.* 2002; Lipnevič 2012).

The quote above has pointed to another important problem in the housing field in Lithuania. The dualist rental system, which promotes home ownership, has created the situation when the private rental sector contributes to the growing shadow economy. In most cases, the landlords make profit without paying any income taxes from the rental business. Another problem is increasing residential segregation. It has been aggravated by the increasing income inequalities but also by increasing age inequality in housing. The richer parts of the population (these are mainly younger citizens) move towards a better quality of housing and leave an old apartment block built during Soviet times (based on the interviews). At the same time, the older generation has no other choice but to stay in decaying houses which need substantial renovation (Raslanas *et al.* 2011). Another interesting phenomenon which is observed in Lithuania and was revealed during the interviews is that young people escape the city and build individual houses in the suburbs, often reconstructing old garden houses which their parents built during Soviet times. This phenomenon reminds of the practices of the Southern European familialistic regime where extended family helps young families obtain their first housing (Aidukaite 2014).

Since 1992 the Lithuanian housing policy supported the privatisation of the housing stock (encouraging people to buy property at a low price) and the decentralisation of the housing policy. From 1995 and onwards, the state has been encouraging the formation of the home owners' self-management organizations (housing partnerships), which assume the responsibility for the management of their housing maintenance and repair. Since 2001, the Civil Code has identified three common forms of property management: the establishment of home owners' self-management organizations, the signed joint venture agreement between home owners' self-management organization and municipality, or appointment of an administrator by the municipality. Until then, either the municipalities or home owners' self-management organizations were responsible for the housing management and maintenance (Aidukaite 2014).

Since 2003, the state has been encouraging the renovation of apartment buildings. At present the priority of the state's housing policy strategy is the encouragement and support of the renovation of the existing housing stock, the quality of which is no longer meeting the requirements. However, the renovation has not been going as fast as it was expected. From 2005 until 2015 there have been renovated 271 multi-storey houses. The renovation currently is implemented on a massive scale and 1,553 projects are being renovated (BETA 2015).

In Lithuania, the renovation has been carried out at the expenses of the apartment owners. The owners have to cover 75% of the expenses of the renovation while the rest is covered by the municipality through the provision of the European Structural Funds. As noted, the younger and wealthier part of the population has been escaping the dwellings which need renovation and buying newly built houses in the suburbs or city centre while the older generation, which has less financial power, has been entitled to meet the renovation demands. In order to facilitate the renovation, in April 12 2012, the Lithuanian Parliament adopted amendments to the law on the common property management, which means that the municipality's appointed administrator can also initiate the renovation of the apartment block. Before that, only home owners' self-management organizations could initiate the renovation of their common property. Only about 16% of the apartment buildings in Lithuania are managed by the home owners' self-management organizations (Lipnevič 2013).

The encouragement of the formation of the home owners' organisations is the state's strategy to transfer all responsibilities for housing maintenance and repair to the home owners. Although, formally, after massive privatisation, the maintenance of the houses was the responsibility of municipalities', in practice, it was being left to the house owners. Since 2005, all municipalities' services were privatized and currently there are about 32 companies that provide housing maintenance services for homeowners in Vilnius (Aidukaite 2014).

In summary, the Lithuanian housing system has resembled many ideal typical features of the liberal housing regime (Lipnevič 2012). In Lithuania the market dominates as the housing provider and the guarantor. The social housing sector is small and only available for most marginalized groups. The prices of real estate are regulated by the market mainly. The construction of the new housing is promoted by large private companies. However, a detailed examination made in this study shows that situation in Lithuania is remarkably different from the liberal regime. In Lithuania so far, the family remains relevant. Low wages and social benefits have created the situation where young families or individuals leaving their parents' home often rely on family support. This feature is common for the Southern European welfare regime (see Allen 2006; Arbaci 2007). Yet, the level of de-commodification can be difficult to measure in case of high home-ownership and low purchasing power of the majority of the population. It has to be also mentioned that the lack of strict spatial planning, that has been absent during the last twenty years in Lithuania, has created important spatial gaps in the infrastructure development: some new neighbourhoods lack adequate infrastructure and, in the near future, may become the places of social and spatial segregation in the cities (Aidukaite 2014).

However, at present, the spatial segregation in the city (for instance in Vilnius, the capital city of Lithuania) is not as high as in Western countries. The historical legacy of the communist period, which sought to reduce class differences in the housing sector as well as small immigration rates, does not yet allow the formation of pockets of exclusion in the cities with the same scope as in Western countries (Aidukaite 2008; Leonavičius, Žilys 2009; Ruoppila 2005). The exception could be some Roma districts that existed during the communist period. During the past twenty years, due to the absence of adequate social policies directed towards Roma population, their situation has deteriorated rapidly.

In conclusion, the Lithuanian housing policy regime, compared to the other welfare state regimes, could be characterized as a regime with the higher owner-occupation but the lower economic power of the owners to take care of their property maintenance, repair and renovation (Aidukaite 2014).

3.6.3. Development Trends of the Housing Market in Lithuania

The development of the residential property market in Lithuania can be defined by several phases. In 1992–2002 the development of property market was related to a more active commercial real property market. The real property market was more focused on the construction of shopping centres, offices and multi-functional buildings, with less attention given to the residential property market. This was due to more profitable and more easily predictable conditions in commercial real property, a significant shortage in contemporary business

facilities and the changed attitude of businesses towards customer service, work and business environment conditions.

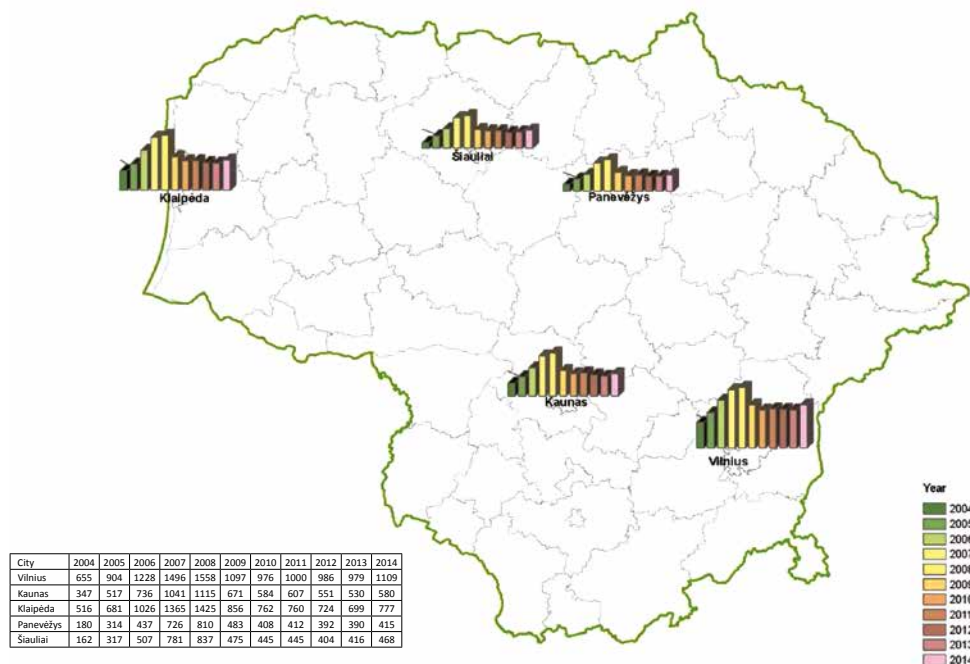
Period from 2002 to 2005 is characterised by the growth in demand in residential real property. Real property market and bank analysts frequently identify this as the period when the real property market 'overheated' – the observed rise in costs was too rapid and often unjustifiable. It was the result of both objective macroeconomic factors (improved conditions for housing loans, growth in wages, the rate of economic growth, etc.) and subjective speculative factors.

For the past 15 years (1994–2009), the Lithuanian housing market was subjected to a large number of changes, which influenced the real estate prices. For this period since beginning of 1994 to end 2007, when the highest price level for apartments was fixed, prices for apartments in the five largest Lithuanian cities increased 8 times (Fig. 3.23). 15 years ago, the average price per square meter was about EUR 200, whereas, as of the moment of top prices, the average price per square meter amounted to EUR 1650. When analysing the data of the same period assuming that the inflation effect is little, it can be estimated that prices increased about 3 times, which means that, since the beginning of 1994 to the end of 2007, prices for apartments on the average increased 3 times compared to increase in prices for other consumer goods and services.

Throughout the last decade residential property market has experienced one of the largest booms as well as one of the hardest falls among other property markets in Lithuania. Influenced by a strong growth of the economy and even stronger future growth forecasts, fuelled by loosely controlled bank credit market and inexpensive lending as well as high future income expectations, the residential property market suffered from quick yet low-quality supply of new residential projects, bankruptcies of many of property developers and failures of many of the inhabitants who took mortgages, to repay or keep with the payment schedule.

In 2004–2007 Lithuania experienced emerging of the housing market and price bubble growth period. This stage is related to the influence of the much-awaited Euro, the appreciation of construction work and work force shortages, favourable lending, a decrease in available land, etc. In 2005 the growth of real property market in Lithuania was very fast. Average increases in the costs of flats in the country's larger cities had grown 50%, and as high as 120% in certain segments in one year (Fig. 3.23).

At the end of 2007, housing prices (for flats and houses, see Figs 3.23 and 3.24) reached their peak. After economic boom, in 2008 prices started to decrease almost all over Lithuania and real property market started showing signs of stagnation: the housing price growth subsided and the number of real property transactions decreased. The world financial crisis materially affected the Lithuanian economy, including the real property market.



Source: Centre of Registers (2015)

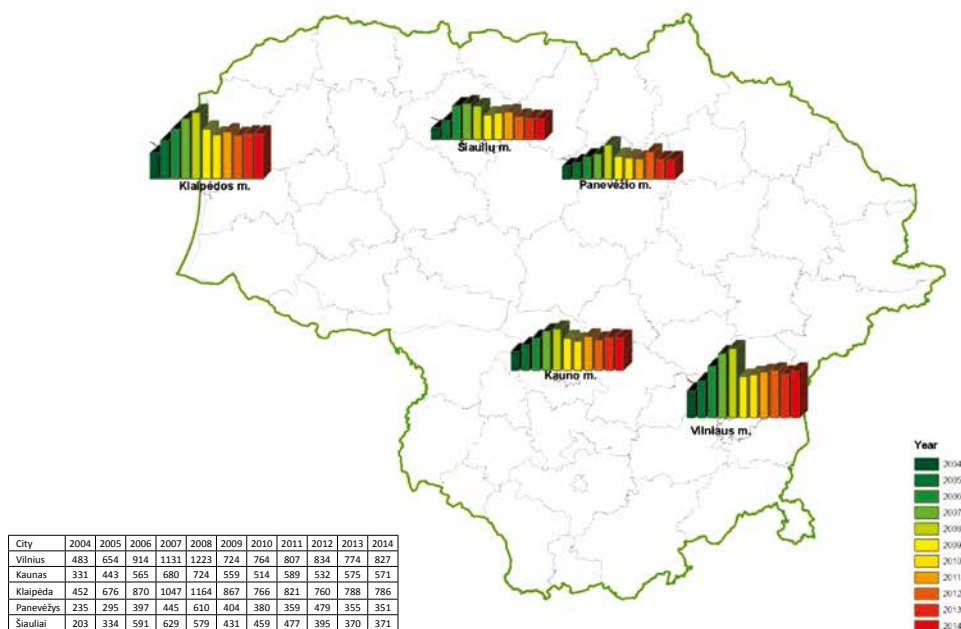
Fig. 3.23. Average sales prices of flats in major cities of Lithuania, 2004–2014 (EUR/m²)

In 2009 residential real property market experienced further significant price drops, the number of transactions plummeted and many of the developers of new residential real properties faced bankruptcies due to severely cut banks' financing and accumulating stock of unsold newly built flats, whereas the banking sector experienced significant level of defaults of mortgages.

Starting from the beginning of 2010 the real property market stabilised with insignificant seasonal changes. The housing market in 2011 retained the stability of the year. Even though residential property prices in the major cities of Lithuania remained fairly stable, further growth in the number of transactions was recorded.

The housing market started the year 2012 with a slight decline in the index of housing prices in the capital and a moderate increase in the index for the rest of the country. So far, the statistics of real estate advertisements shows the fall in prices and supply stability or even increase. During January–March 2012, there were a little more than 5,000 apartment purchase transactions registered in Lithuania. This is by 8% more as compared to the 1st quarter of 2011, and it almost reached the numbers of 2008 (during the first quarters of 2009–2011,

the number of apartment purchase transactions was significantly lower – 2,894, 4,034, 4,649 respectively).



Source: Centre of Registers (2015)

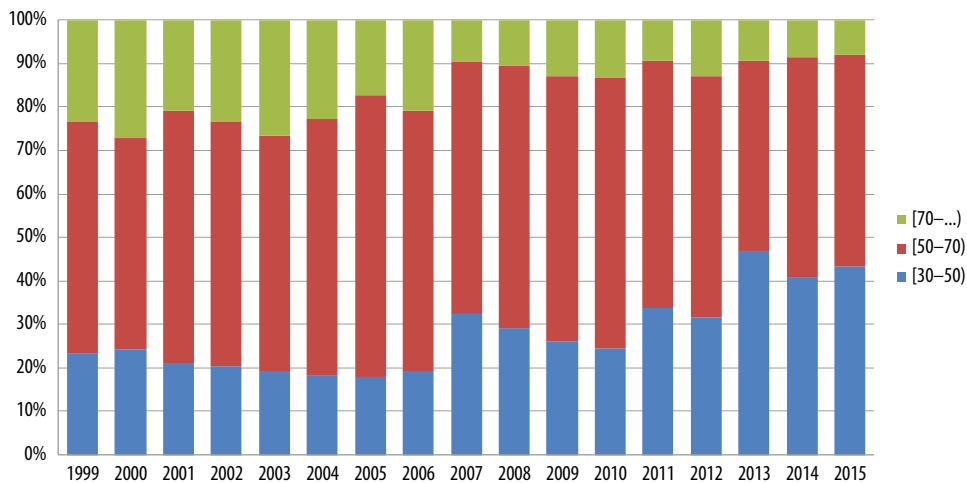
Fig. 3.24. Average sales prices of family houses in major cities of Lithuania, 2004–2014 (EUR/m²)

Although the prices edged up by an average of just 1.2% in 2013 versus 2012, the increase was recorded in new construction flats segment– about 1,400 of new apartments were sold – i.e. 48 pct. more than in the first half-year of 2012. During the first half-year the sales of 29 new projects with more than 1,200 flats were started in Lithuania. In comparison with the corresponding period of the previous year, the amount of new apartments, offered for the market, was twice less. The price level has increased in all housing segments within a year, especially in Vilnius (see Fig. 3.23).

In the first quarter of 2014, the fastest growth in the real estate market activity was recorded in the housing segment. The number of single-family houses and flats, which changed hands in that period, soared by 43% in year-on-year terms (seasonally adjusted; by 15% in quarter-on-quarter terms), mostly as a result of the rapid economic growth, the search for alternative investment opportunities in the prolonged environment of low interest rates (amid low yields on risk-free assets), the expected change of the national currency and, presumably, efforts to legalize some of the money circulating in the shadow economy.

Overall, the growth of housing prices was driven by all market segments, except for newly built flats in Vilnius, which, most probably, was related to an increase in the number of transactions involving the acquisition of properties at a less advanced stage of completion compared with the previous periods (e.g. with more apartments sold without any interior decoration), therefore, such statistics should be interpreted with caution.

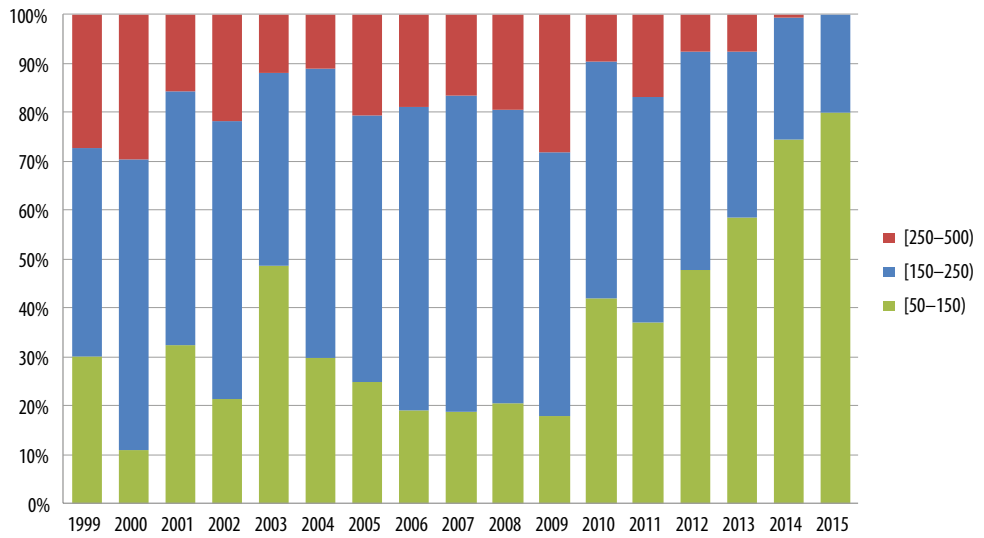
Cyclical fluctuations of Lithuanian economy and real estate market had influence on preferred residential property areas in segment of flats (see Fig. 3.25 for case of Vilnius). During the period of expansion (1999–2006) demand for bigger apartments was almost equal to demand of smaller apartments. During the period of crisis and afterwards situation changed – demand for smaller apartments (30–50 m²) significantly increased and in 2013 reached 46.8% of transactions. This change was influenced mostly by lower purchasing power of households as well as substantial increase of heating costs. During the whole period of 2004–2014 the highest demanded apartments were 50–70 m² – share of such kind of transactions was 50% and higher.



Source: Centre of Registers (2015)

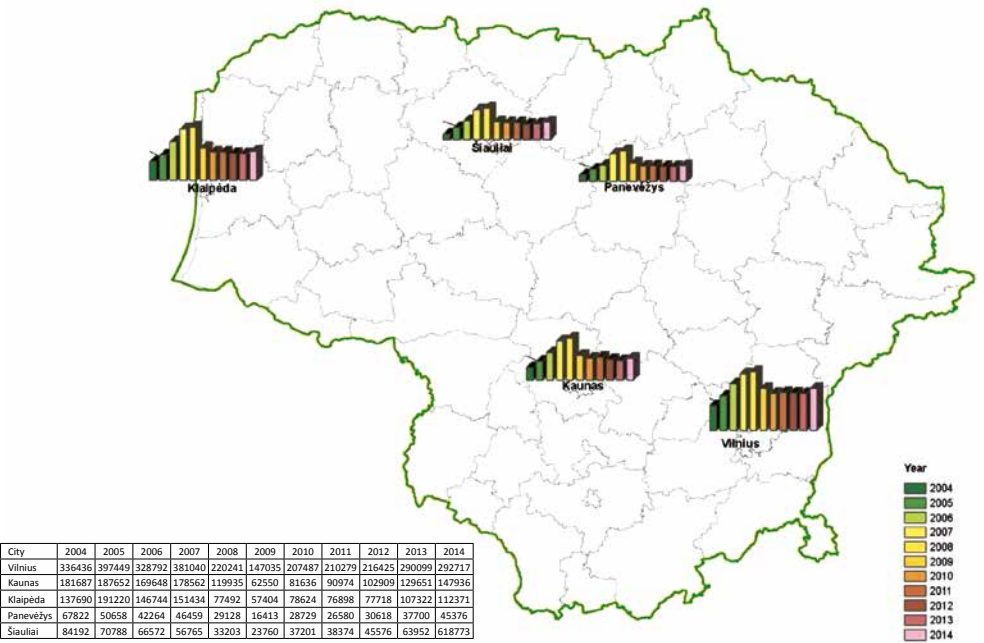
Fig. 3.25. New building apartments transactions according to residential area (Vilnius), 1999–2015

Changes in preferences for new houses' residential area reflected cyclical fluctuations even more visible. Demand for smaller houses (50–150 m²) during periods of crisis and marked adjustment considerably increased and in 2014 reached such transactions accounted 74.3% of transactions for individual houses, while during the expansion periods higher residential area (150–250 m²) houses were demanded (see Fig. 3.26 for case of Vilnius).



Source: Centre of Registers (2015)

Fig. 3.26. New building houses transactions according to residential area (Vilnius), 1999–2015

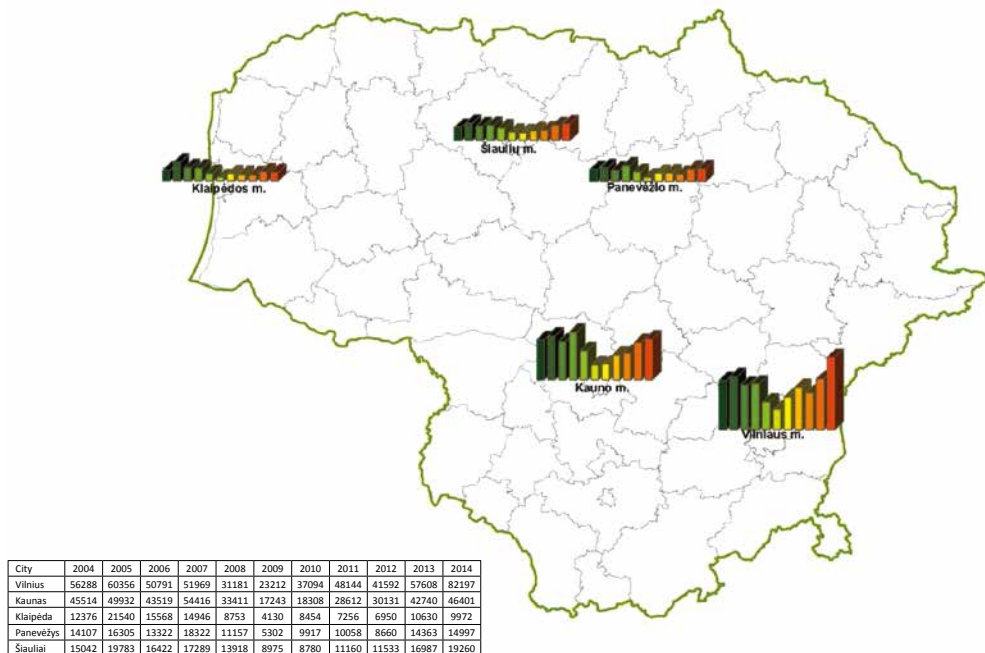


Source: Centre of Registers (2015)

Fig. 3.27. Area of sold flats in major cities of Lithuania, 2004–2014 (m²)

Statistics shows that 2-room apartments dominate in the current supply (38% of the supply). 3-room apartments make one-third of the total supply; 1 and 4 room apartments make one tenth of the supply each; while the rest are larger than 4-room apartments.

Data shows that the total areas of sold flats and family houses substantially increased during the period of 2004–2008. Period of 2009–2012 can be characterised as crisis and stagnation of residential market. Recovery is observed since 2013. These trends are particular for most of all major cities of Lithuania, especially Vilnius, Kaunas and Klaipėda (see Fig. 3.27 for flats and Fig. 3.28 for family houses).



Source: Centre of Registers (2015)

Fig. 3.28. Areas of sold family houses in major cities of Lithuania, 2004–2014 (m²)

3.6.4. Multiple Criteria Assessment of Housing Sustainability in Lithuania

In 2014 L. Tupėnaitė with researches from Tallinn University of Technology (Prof. I. Lill and Assoc. Prof. T. Nuuter) performed the multiple criteria assessment of the housing sustainability in the Baltic countries in comparison to the other European countries (see Nuuter *et al.* 2015). Here some of the main findings are presented.

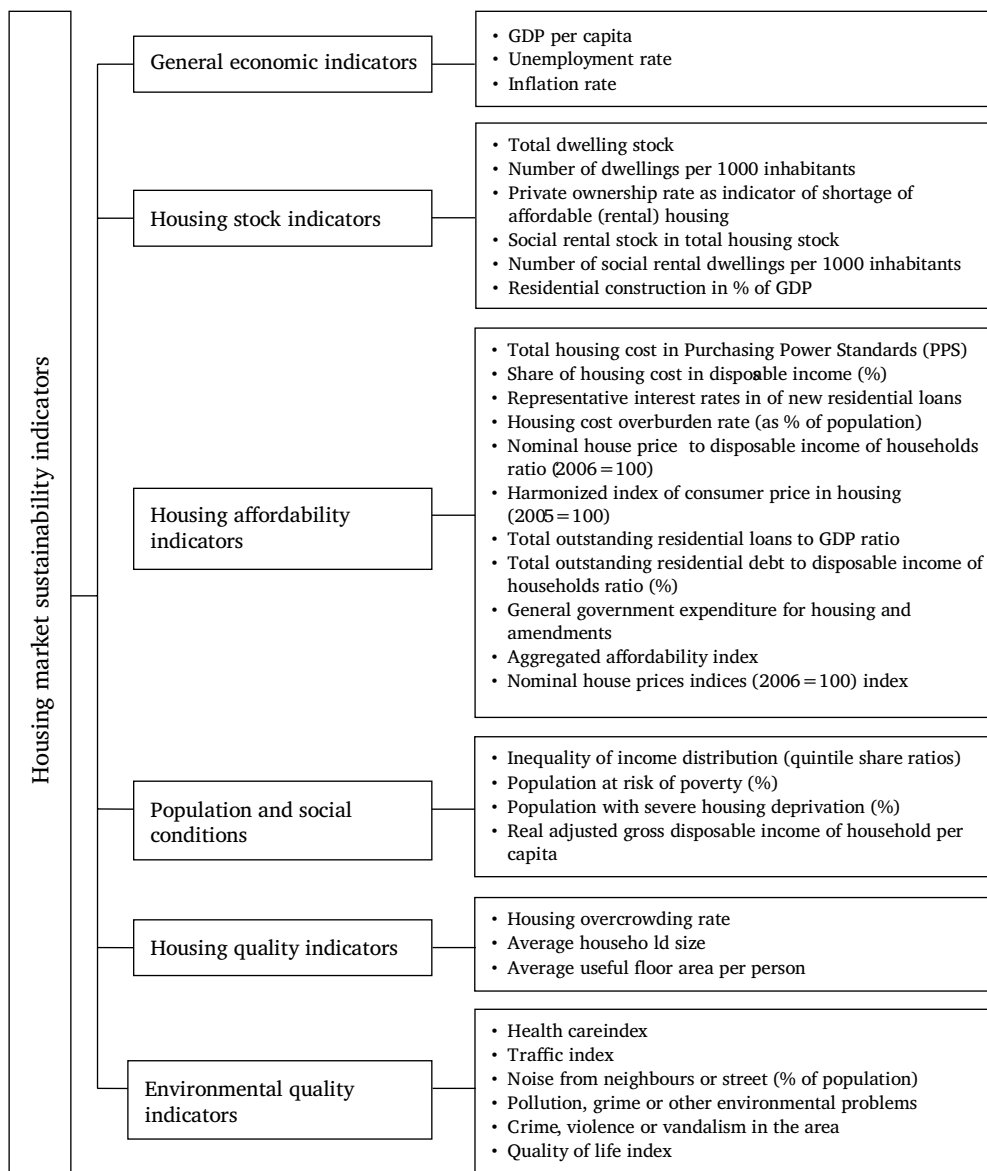


Fig. 3.29. System of criteria for housing market sustainability assessment
(Nuuter *et al.* 2015)

As multiple criteria assessment embraces many aspects of sustainable housing, it is required to include as much criteria as possible, but limited to the data and its compatibility. The uniform data for 2012 presented in EU statistical overviews (Eurostat 2014a; HYPOSTAT 2013; NUMBEO 2014) was used.

To assess the sustainability of excessive owner occupied housing Nuuter *et al.* (2015) divided indicators into six groups: general economic, housing stock, housing affordability indicators, population and social conditions, housing as well as environmental quality indicators. The developed system of criteria is presented in Figure 3.29. Weights of criteria in each group of criteria were determined by experts from Tallinn University of Technology and Vilnius Gediminas Technical University.

For assessment of housing market sustainability a method of Multiple Criteria Proportional Assessment (COPRAS) developed by Zavadskas and Kaklauskas (1996) was chosen. This method is relatively simple and can provide complete ranking of compared countries according to chosen criteria. Method was recently used by Mulliner *et al.* (2013) to assess the affordability of different housing alternatives in the UK and different sustainable housing issues in Europe.

The determination of significance and priority of alternatives (in this case – countries) is carried out in four stages, according to algorithm depicted in Figure 3.30.

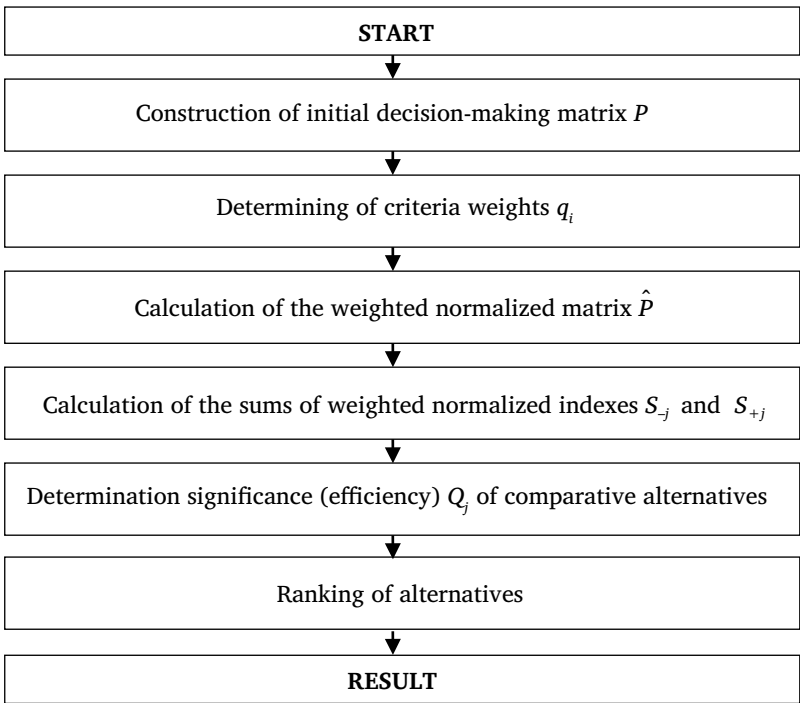


Fig. 3.30. Algorithm of the COPRAS method

Stage 1. The weighted normalized decision-making matrix P is constructed. The purpose of this stage is to receive dimensionless weighted values of the

attributes. All attributes, originally having different dimensions, can be compared when their dimensionless values are known. The following equation is used:

$$\hat{x}_{ij} = \frac{x_{ij} \cdot q_i}{\sum_{j=1}^n x_{ij}}; \quad i = \overline{1, m}; \quad j = \overline{1, n}, \quad (3.1)$$

where n – number of alternatives; m – number of attributes; x_{ij} – the attribute value of the j^{th} alternative; q_i – significance (weight) of i^{th} criterion.

The sum of dimensionless weighted index values of each criterion is always equal to the significance q_i of this criterion:

$$q_i = \sum_{j=1}^n \hat{x}_{ij}; \quad i = \overline{1, m}; \quad j = \overline{1, n}. \quad (3.2)$$

In other words, the value of significance q_i of the investigated criterion is proportionally distributed among all alternative versions a_j according to their values x_{ij} .

Stage 2. The sums of weighted normalized indexes describing the j^{th} alternative are calculated. The options are described by minimizing attributes S_{-j} and maximizing attributes S_{+j} . The sums are calculated according to the Eqn (3.3):

$$S_{+j} = \sum_{i=1}^m \hat{x}_{+ij}; \quad S_{-j} = \sum_{i=1}^m \hat{x}_{-ij}; \quad i = \overline{1, m}; \quad j = \overline{1, n}. \quad (3.3)$$

In this case, the values S_{+j} (the greater is this value, the more satisfied are the interested parties) and S_{-j} (the lower is this value, the better is goal attainment by the interested parties) express the degree of goals attained by the interested parties in each alternative. In any case the sums of “pluses” S_{+j} and “minuses” S_{-j} of all alternative projects are always respectively equal to all sums of significances of maximized and minimized attributes:

$$S_{+} = \sum_{j=1}^n S_{+j} = \sum_{i=1}^m \sum_{j=1}^n \hat{x}_{+ij},$$

$$S_{-} = \sum_{j=1}^n S_{-j} = \sum_{i=1}^m \sum_{j=1}^n \hat{x}_{-ij}; \quad i = \overline{1, m}; \quad j = \overline{1, n}. \quad (3.4)$$

In this way, the calculations made may be additionally checked.

Stage 3. The significance (efficiency) of comparative alternatives is determined on the basis of describing positive (pluses) and negative (minuses)

characteristics. Relative significance Q_j of each alternative a_j is found according to the formula:

$$Q_j = S_{+j} + \frac{S_{-\min} \cdot \sum_{j=1}^n S_{-j}}{S_{-j} \cdot \sum_{j=1}^n \frac{S_{-\min}}{S_{-j}}}; j = \overline{1, n}. \quad (3.5)$$

Stage 4. Determining the priority order of alternatives. The greater the Q_j , the higher is the efficiency of an alternative.

The analysis of the method presented makes it possible to state that one can easily apply it to evaluating the alternatives and selecting the most efficient one, while being completely aware of the physical meaning of the process. Moreover, the method allows the formulation of a reduced criterion Q_j that is directly proportional to the relative effect of the compared values x_{ij} and weight q_i on the final result.

In order to visually assess alternative efficiency the utility degree N_j can be calculated (Kaklauskas 1999). For this purpose *Method of determining the utility degree and market value of an object* developed by Kaklauskas (1999) is used. The degree of utility is determined by comparing the alternative analyzed with the most efficient alternative. In this case, all the utility degree values related to the alternative analysed will be ranged from 0% to 100%. The formula used for the calculation of alternative a_j utility degree is given below:

$$N_j = \frac{Q_j}{Q_{\max}} \cdot 100\%. \quad (3.6)$$

Different EU countries have different housing policies and history, different economic development and different tenure forms to name the few features. For case study nine EU countries were selected: these with high home ownership rate as the Baltic States and Spain and for comparison the countries with long housing market history and much experience in the field of housing research: UK, Denmark, Finland, Sweden and Germany. Data for the assessment was acquired from Eurostat (2014a), HYPOSTAT (2013) and NUMBEO (2014). Initial decision making matrix is presented in Table 3.8.

During the analysis the normalization of decision making matrix was performed and weighted decision making matrix was constructed (Eqns (3.1)–(3.4)). Further, basing on the matrix data the multiple criteria assessment is performed by COPRAS methodology and the significances Q_j for each analysed alternative were calculated (Eqn (3.5)). Then the utility degree was determined basing on Eqn (3.6).

Table 3.8. Housing indicators of the compared European countries

Groups of indicators	Indicators	Measuring unit	Estonia	Lithuania	Latvia	Spain	Finland	Sweden	Denmark	Germany	UK	Weight	Min/Max
General economic indicators	GDP per capita in PPS (EU28 = 100)	%	69	70	70	97	115	129	125	122	110	0.4	Max
	Unemployment rate	%	10.2	13.3	14.9	25	7.7	8	7.5	5.5	7.9	0.3	Min
	Inflation rate	%	4.2	3.2	2.3	2.4	3.2	0.9	2.4	2.1	2.8	0.3	Min
Housing stock indicators	Total dwelling stock (*1000)	number*100	651	1308	1042	25129	2784	4508	2680	39268	27108	0.1	Max
	Number of dwellings per 1000 inhab	number per 1000 inhab	485	390	461	544	531	479	500	490	443	0.2	Max
	Private ownership rate as indicator of shortage of affordable (rental) housing	%	96	91.9	81.2	78.9	73.9	69.9	64.3	53.3	66.7	0.3	Min
	Social rental stock as % of total housing stock	%	1	3	0.4	2	16	18	19	4.6	18	0.2	Max
	Number of social rental dwellings per 1000 inhab.	number per 1000 inhab	5	11.7	4.16	10.9	85	84	95	22.6	80	0.2	Max
	Residential Construction in % GDP	%	3.5	1.8	1.9	5.2	6.7	3.2	4.2	5.8	3.3	0.1	Max
	Total housing cost in Purchasing Power Standards (PPS)	PPS	201.9	187.1	192.2	357.7	415.6	541.6	693	671.1	489.9	0.1	Min
Housing affordability indicators	Share of housing costs in disposable income (%)	%	19.1	20.1	21.7	21.6	17.9	23	30.1	27.9	19.8	0.05	Min
	Representative Interest Rates on New Residential Loans	%	2.89	2.97	3.66	2	1.97	3.54	3.67	3.07	3.69	0.05	Min
	Housing cost overburden rate (as % of population)	% of population	7.9	8.9	11.2	14.3	4.5	9	17.8	16.6	7.4	0.1	Min
	Nominal House Price to Disposable Income of Households Ratio (2006 = 100)	%	56.4	58.3	65.4	71.5	93.7	88.7	72.1	95.9	104	0.1	Min
	Harmonised index of consumers price in housing (2005 = 100), 2012 M12	%	183.06	190.37	209.62	141.49	133.61	120.96	125.8	120.7	148.6	0.1	Min
	Total Outstanding Residential Loans to GDP Ratio (%)	%	34.4	17.9	24.2	61.1	44.4	80.7	100.8	44.8	81	0.05	Min
	Total Outstanding Residential Debt to Disposable Income of Households Ratio, %	%	64.3	30.2	40	94.7	72.9	156.5	205.7	66.2	119.1	0.05	Min
	Nominal House Prices Indices (2006 = 100)	Index	75.3	78.3	87.7	76.9	120.7	124.1	85.1	108.7	109.3	0.1	Min

Groups of indicators	Indicators	Measuring unit	Lithuania	Latvia	Spain	Finland	Sweden	Denmark	Germany	UK	Weight	Min/Max
Housing affordability indicators	General government expenditures for housing and community amendments (as % of GDP) – 2011 data	% of GDP	0.6	1.3	0.6	0.6	0.7	0.4	6	0.9	0.1	Max
	Aggregated affordability index	Index	0.97	1.27	1.43	1.79	1.67	2.3	2.61	1.93	0.2	Max
	Inequality of income distribution S80/S20 income quintile share ratio EUROSTAT	Index	2.9	3.7	4.1	3.3	3.4	3.1	3.9	4.2	0.2	Min
	Population at risk of poverty or social exclusion (%)	%	23.4	36.6	28.2	17.2	18.2	19	19.6	24.1	0.2	Min
Housing quality indicators	Population with severe housing deprivation (%)	%	72	59.7	85.1	89.2	87.2	78.2	83.4	78.6	0.3	Max
	Real adjusted gross disposable income of households per capita	PPS	11567	7927	18439	22867	22808	21154	25914	21474	0.3	Max
	Housing overcrowding rate (EUROSTAT) 2012	%	15.5	40.3	6	3.6	9.2	6.7	5.5	7	0.2	Min
	Average household size	Number of people	2.2	2.5	2.6	2.1	2.1	1.9	2	2.3	0.2	Min
Environmental quality indicators	Average useful floor area per person	m ²	30	27	35	38.9	40	65	55	33	0.6	Max
	Health Care Index	Index	78.06	71.38	75.61	76.41	78.7	86.13	73.25	71.28	0.1	Max
	Traffic Index	Index	48.59	60.3	65.89	162.67	60.12	55.3	74.55	114.88	0.1	Min
	Noise from neighbours or from the street (% of population) EUROSTAT	% of population	12.8	15.4	15	14.2	13	17.5	26.1	18.2	0.1	Min
	Pollution, grime or other environmental problems (EUROSTAT)	% of population	11.9	22.2	8	8.8	7.6	5.7	22.4	8.3	0.2	Min
	Crime, violence or vandalism in the area (EUROSTAT)	Index	15.7	17.2	10.1	8.6	9.6	10.3	12.5	19.7	0.2	Min
	Quality of Life Index	Index	154.94	122.18	141.05	167.21	191.36	182.29	204.84	148.14	0.3	Max

Table 3.9. Multiple criteria assessment of housing stock

Criteria describing the alternatives	*	Measuring units	Weight	Compared alternatives								
				Estonia	Lithuania	Latvia	Spain	Finland	Sweden	Denmark	Germany	United Kingdom
Total dwelling stock	+	Num-ber*1000	0.1	0.0006	0.0013	0.001	0.0241	0.0027	0.0043	0.0025	0.0376	0.026
Number of dwellings per 1000 inhab	+	Number per 1000 inhab	0.2	0.0224	0.018	0.0213	0.0252	0.0246	0.0222	0.0231	0.0227	0.0205
Private ownership rate as indicator of shortage of affordable (rental) housing	-	%	0.3	0.0426	0.0408	0.036	0.035	0.0328	0.031	0.0285	0.0237	0.0296
Social rental stock as % of total housing stock	+	%	0.2	0.0024	0.0073	0.001	0.0049	0.039	0.0439	0.0463	0.0112	0.0439
Number of social rental dwellings per 1000 inhab.	+	Number per 1000 inhab	0.2	0.0025	0.0059	0.0021	0.0055	0.0427	0.0422	0.0477	0.0113	0.0402
Residential Construction in % GDP	+	%	0.1	0.0098	0.0051	0.0053	0.0146	0.0188	0.009	0.0118	0.0163	0.0093
The sums of weighted normalized maximizing (projects pluses') indices of the alternative				0.0377	0.0376	0.0307	0.0743	0.1278	0.1216	0.1314	0.0991	0.1399
The sums of weighted normalized minimizing (projects 'minuses') indices of the alternative				0.0426	0.0408	0.036	0.035	0.0328	0.031	0.0285	0.0237	0.0296
Significance of the alternative				0.063	0.064	0.0607	0.1051	0.1607	0.1564	0.1692	0.1446	0.1763
Priority of the alternative				8	7	9	6	3	4	2	5	1
Utility degree of the alternative (%)				35.74%	36.31%	34.40%	59.61%	91.12%	88.69%	95.98%	82.01%	100%

At first the assessment of housing market sustainability was performed in each group of criteria. For instance, the results of multiple criteria evaluation in the group of “housing stock indicators” are provided in Table 3.9.

Analysis of the results revealed that the best housing stock situation was in the United Kingdom (utility degree 100%) and the worst in Latvia (34.4%). Estonia's housing stock was ranked in 7th place (utility degree 36.31%). The same analysis was performed in all groups of criteria and the utility degrees were determined. General calculation results are presented in Figure 3.31.

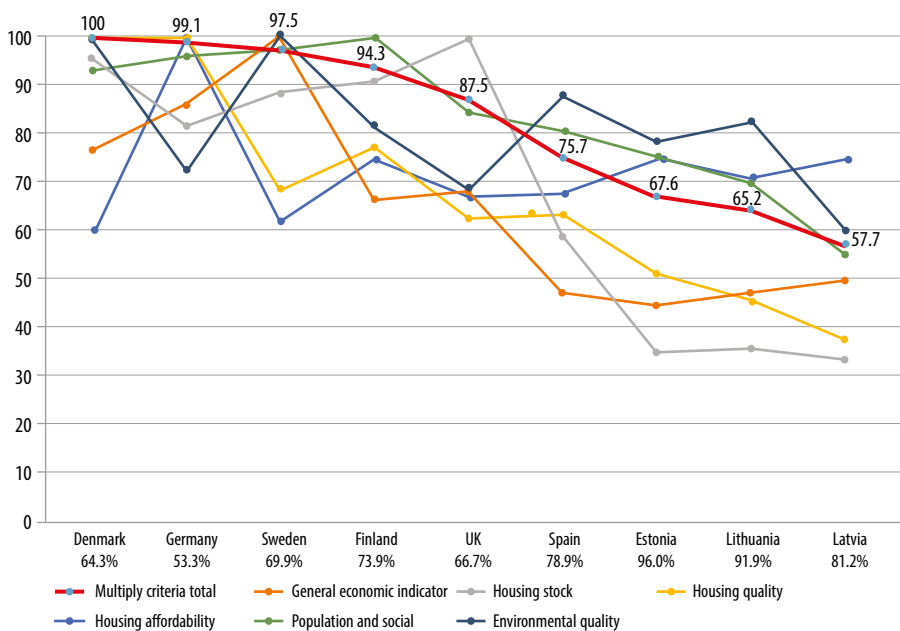


Fig. 3.31. General assessment results (Nuuter *et al.* 2015)

By all groups of criteria, the most sustainable housing is in Denmark, but surprisingly Denmark takes last place by the housing affordability criteria. Rankings of housing sustainability for Lithuania, among other countries are presented in Table 3.10. Utility degrees (%) were calculated by using approximation approach according to Method of determining the utility degree and market value of an object developed by Kaklauskas (1999).

Lithuania takes 8th ranking by all groups of criteria (9 countries were assessed). The highest ranks can be observed in housing affordability (5th rank) and environmental indicators (4th rank). It means that there are a lot of areas in housing sector to be improved.

Table 3.10. Ranking of Lithuania's housing market according to sustainability indicators (basing on results presented in Nuuter *et al.* 2015)

Criteria groups	Utility degree (%)	Place among other countries
General economic conditions	47.41	8
Housing stock indicators	36.31	7
Housing affordability indicators	71.01	5
Population and social conditions	70.16	8
Housing quality indicators	46.47	8
Environmental indicators	82.20	4
General rank	65.18	8

The same pattern is evident for all of the Baltic States. These odds can be justified with low ranking of housing stock and its quality, which in turn means that house prices consist of majority of resells and a small proportion of new houses (Nuuter *et al.* 2015). However, industrial countries with mature economy and housing market cannot be strictly compared to the economies in transitions, but all the countries have more or less suffered the housing bubbles and economic downturns (Kaklauskas *et al.* 2011).

According to the income diversity and justification by the multiple criteria assessment, economically sustainable share of home-ownership is in Lithuania approximately 73.25%. Housing policies should be aimed to assist social housing and rental sector, which act as buffers for those who have lost their homes or do not qualify for mortgage loans.

This multiple criteria assessment methodology can be adapted to different regions and cities, as unemployment rate, income and area per resident are diversified. So it gives a valuable tool to assess the sustainability of housing in different regions and revise policies so that every resident can live in affordable and high quality home. Furthermore, proposed methodology can be used for residential markets assessments in order to find the major strengths and weaknesses of the markets and to select the most appropriate measures for crisis management.

REFERENCES

- Adams, Z.; Füß, R. 2010. Macroeconomic determinants of international housing markets, *Journal of Housing Economics* 19(1): 38–50.
- Admidins, D.; Zvanitajs, J. 2011. The most significant factors that will affect the demand for real estate market objects in Latvia in the nearest future, in *Proc. of the 1st International Scientific Conference „Practice and Research in Private and Public Sector-11*, 5 May, 2011, Vilnius, Lithuania, 126–133.
- Adrian, T.; Shin, H. S. 2009. Money, liquidity, and monetary policy, *American Economic Review* 99(2): 600–605.
- Agell, J.; Englund, P.; Södersten, J. 1995. *Swedish tax policy in theory and practice*. Appendix No. 1 to the Tax Reform Evaluation Report. Sweden.
- Agnello, L.; Schuknecht, L. 2011. Booms and busts in housing markets: Determinants and implications, *Journal of Housing Economics* 20: 171–190.
- Agnello, L.; Sousa, R. 2011. *Can fiscal policy stimulus boost economic recovery?* Paris: Banque De France Document de Travail. 325 p.
- Ahrend, R.; Cournéde, B.; Price, R. 2008. *Monetary policy, market excesses, and financial turmoil*. OECD Economics Department Working Paper. No. 597.
- Aidukaite, J. 2008. Urban poverty and social policy: An insight into the case of Vilnius. Paper presented at the higher seminar series at the Sodertorn University, Denmark, 28 October 2008.
- Aidukaite, J. 2011. Welfare reforms and socioeconomic trends in the ten new EU member states of central and Eastern Europe, *Journal of Communist and Post-Communist Studies* 44(3): 211–219.
- Aidukaite, J. 2014. Housing policy regime in Lithuania: towards liberalization and marketization, *GeoJournal* 79: 421–432.
- Aidukaite, J.; Bogdanova, N.; Guogis, A. 2012. *Gerovės valstybės raida Lietuvoje: mitas ar realybė?* [Creation of the welfare state in Lithuania: myth or reality?]. Vilnius: Lithuanian Social Research Centre. 35 p. (in Lithuanian).
- Aidukaite, J.; Genelyte, I. 2012. Social policy and migration in the Baltic state. Paper presented at the *International Sociological Association's research Committee on Poverty, Social Welfare and Social Policy (RC19) Annual Meeting*, 23–25 August, 2012. Oslo, Norway.
- Ainsaar, M.; Stankuniene, V. 2011. Demographic cost of transition and the future of the Baltic States, in M. Lauristin (Ed.). *Estonian human development report. Baltic ways(s) of human development: twenty years on*. Tallinn: Eesti Koostöö Kogu, 44–51.
- Aleknavičius, A. 2009a. Experience of Lithuanian land consolidation projects, in *Transactions of Estonian University of Life Sciences – Baltic Surviving'09*, 5–10.
- Aleknavičius, A. 2009b. Possibilities for rural development implementing land consolidation projects in Lithuania, *Rural development* 4: 2–6.
- Alessi, L.; Detken, C. 2011. Quasi real time early warning indicators for costly asset price boom/bust cycles, *European Journal of Political Economy* 27(3): 520–533.
- Alexander, E. R. 2001. A transaction-cost theory of land use planning and development control, *Town Planning Review* 72(1): 45–76.

- Alexander, E. R. 2014. Land-property markets and planning: A special case, *Land Use Policy* 41: 533–540.
- Allen, F.; Carletti, E. 2010. What should central banks do about real estate prices?" [online], [cited 12 May 2015]. Available from Internet: <http://fic.wharton.upenn.edu/fic/papers/11/11-29.pdf>
- Allen, F.; Chui, M. K. F.; Maddaloni, A. 2004. Financial systems in the USA, Europe and Asia, *Oxford Review of Economic Policy* 20(4): 490–508.
- Allen, F.; Gale, D. 2000. Bubbles and Crises, *The Economic Journal* 110: 236–255.
- Allen, J. 2006. Welfare regimes, welfare systems and housing in Southern Europe, *International Journal of Housing Policy* 6(3): 251–277.
- Aloui, R.; Assa, M.; Nguyen, D. 2011. Global financial crisis, extreme interdependences, and contagion effects: the role of economic structure? *Journal of Banking & Finance* 35: 130–141.
- Andersen, C. 2009. *Baltic Tiger' plots comeback*. IMF Survey Magazine: Countries and Regions. 22 p.
- Andrew, M.; Meen, G. 2003. House price appreciation, transactions and structural change in the British housing market: a macroeconomic perspective, *Real Estate Economics* 31: 99–116.
- Anglin, P.; Rutherford, R.; Springer, T. M. 2003. The trade-off between the selling price of residential properties and time-on-the-market: the impact of price setting, *Journal of Real Estate Finance and Economics* 26: 95–111.
- Antrop, M. 2004. Landscape change and the urbanization process in Europe, *Landscape Urban Plan* 67: 9–26.
- Arbaci, S. 2007. Ethnic segregation, housing systems and welfare regimes in Europe, *International Journal of Housing Policy* 7(4): 401–433.
- Asaul, A. N.; Karasev, A. V. 2001. Рынок недвижимости в системе рынков, Административно-управленческий портал [online], [cited 12 May 2015]. Available from Internet: http://www.aup.ru/books/m76/2_1.htm portal (in Russian).
- Augutiene, J. 2014. *Lithuanian experiences with a national land consolidation program 2005–2013*. Powerpoint presentation for Baltic Land Consolidation Workshop in Riga, April 2014.
- Australian Conservation Foundation and Victorian Council of Social Service (ACF & VCOS). 2008. *Housing affordability: More than rents and mortgages* [online], [cited 20 May 2015]. Available from Internet: http://www.vcross.org.au/documents/VCOS%20docs/Housing/REP_ACF_VCOSS%20Housing%20Affordability%20October%202008%20.PDF.
- Azbainis, V.; Rudzkiene, V. 2011. Pereinamojo laikotarpio ir ekonomikos krizės poveikio nekilnojamojo turto rinkai vertinimas, *Verslas: teorija ir praktika* 12(2): 150–161 (in Lithuanian).
- Bahadir, B.; Mykhaylova, O. 2014. Housing market dynamics with delays in the construction sector, *Journal of Housing Economics* 26: 94–108.
- Baker, D.; Sipe, N.; Gleeson, B. 2006. Performance-based planning: perspectives from the United States, Australia and New Zealand, *Journal of Planning Education and Research* 25(4): 396–409.
- Balchin, P. 1996. *Housing policy in Europe*. London: Routledge. 349 p.

- Ball, M. 2003. *Improving housing market*. RICS Leading Edge Series, May. 55 p.
- Banaitienė, N.; Banaitis, A.; Norkus A. 2012. Risk management in projects: peculiarities of Lithuanian construction companies, *International journal of strategic property management* 15(1): 60–73.
- Bank of Lithuania. 2015. *Financial stability review 2015*. Vilnius: Bank of Lithuania. 65 p.
- Barberis, N.; Shleifer, A.; Vishny, R. 1998. A Model of investor sentiment, *Journal of Financial Economics* 49: 307–343.
- Barker, K. 2004. *Review of housing supply: Delivering stability: Securing our future housing needs*. Final Report – Recommendations. Norwich, England: Her Majesty's Stationery Office [online], [cited 12 May 2015]. Available from Internet: http://www.hm-treasury.gov.uk/consultations_and_legislation/barker/consult_barker_index.cfm.
- Barker, K. 2006. *Barker review of land use planning* [online], [cited 12 May 2015]. Available from Internet: http://www.hm-treasury.gov.uk/media/4EB/AF/barker_finalreport051206.pdf.
- Barsky, R. B.; Sims, E. R. 2012. Information, animal spirits, and the meaning of innovations in consumer confidence, *American Economic Review* 102(4): 1343–1377.
- Bartuska, T. J.; Young, G. L.; McClure, W. R. (Eds). 2007. *The built environment: A collaborative inquiry into design and planning*. 2nd ed. Wiley, John & Sons. 424 p.
- Battellino, R. 2008. *Background notes for opening remarks to Senate Select Committee on housing affordability in Australia*, 24 April 2008, Melbourne, Australia.
- Berkovec, J. A.; Goodman, J. L. 1996. Turnover as a measure of demand for existing homes, *Real Estate Economics* 24: 421–440.
- Bernanke, B. S. 2002. *Asset price bubbles and monetary policy*. Remarks before the New York Chapter of the National Association for Business Economics, New York, NY, October 15 [online], [cited 11 May 2015]. Available from Internet: <http://www.federalreserve.gov/boarddocs/speeches/2002/20021015/>.
- Bertaud, A.; Renaud, B. 1997. Socialist cities without land markets, *Journal of Urban Economics* 41(1): 137–151.
- BETA. 2015. *Multi-apartment building renovation (modernisation) programme* [online], [cited 10 May 2015]. Available from Internet: <http://www.betal.it/en/projects/>.
- Binswanger, H.; Deininger, K.; Feder, G. 1995. Agricultural land relations in the developing world, *American Journal of Agricultural Economics* 75: 1242–1248.
- Björklund, K.; Söderberg, B. 1999. Property cycles, speculative bubbles and the gross income multiplier, *Journal of Real Estate Research* 18(1): 151–174.
- Bjørnland, H. C.; Jacobsen, D. H. 2010. The role of house prices in the monetary policy transmission mechanism in small open economies, *Journal of Financial Stability* 6: 218–229.
- Black, A.; Fraser, P.; Hoesli, M. 2006. House prices, fundamentals and bubbles, *Journal of Business Finance & Accounting* 33(9&10): 1535–1555.
- Blancard, S.; Boussemart, J. P.; Briec, W.; Kerstens, K. 2006. Short- and long-run credit constraints in French agriculture: A directional distance function framework using expenditure-constrained profit functions, *American Journal of Agricultural Economics* 88(2): 351–364.
- Blōžienė, O. 2013. Būstas kaip darnių bendruomenių vystymo pagrindas [Housing as a basis for the development of sustainable communities]. Presentation made at the *Conference*

- "Sustainable Development in the Process of Urbanization and Community Education), 5 November 2013, Vilnius, Vilnius municipality.
- Bogdon, A. S.; Can, A. 1997. Indicators of local housing affordability: Comparative and spatial approaches, *Real Estate Economics* 25: 43–80.
- Booth, P. 2002. Nationalizing development rights: the feudal origins of the British planning system, *Environment & Planning B* 22(1): 129–140.
- Bordo, M.; Jeanne, O. 2002. *Boom–busts in asset prices, economic instability, and monetary policy*. NBER Working Paper. 8966 p.
- Borio, C.; Lowe, P. 2002. *Asset prices, financial and monetary stability: exploring the nexus*. BIS Working Paper. 114 p.
- Bourassa, S. C.; Haurin, D. R.; Haurin, J. L.; Hoesli, M.; Sun, J. 2009. House price changes and idiosyncratic risk: the impact of property characteristics, *Real Estate Economics* 37: 259–278.
- Bowen, A. 1994. Housing and the Macroeconomy in the United Kingdom, *Housing Policy Debate* 5(3): 241–251.
- Bramley, G. 1994. An affordability crisis in British housing: Dimensions, causes and policy impact, *Housing Studies* 9: 103–124.
- Brash, D. 2008. Introduction to the 4th Annual demographia international housing affordability survey [online], [cited 12 May 2015]. Available from Internet: <http://www.demographia.com/dhi.pdf>.
- Brett, D. L.; Schitz, A. 2009. *Real estate market analysis. Methods and case studies*. 2nd ed. Washington, DC: Urban Land Institute. 271 p.
- Breustedt, G.; Habermann, H. 2011. The incidence of EU per-hectare payments on farmland rental rates: A spatial econometric analysis of German farm-level data, *Journal of Agricultural Economics* 62(1): 225–243.
- Brueckner, J. K. 2007. Government land-use interventions: An economic analysis, in *4th Urban Research Symposium*, 2007, World Bank, Washington, D.C. 22 p.
- Buckley, R. M.; Tsenkova, S. 2012. *Housing market systems in reforming socialist economies: Comparative indicators of performance and policy* [online], [cited 10 May 2015]. Available from Internet: <http://www.ucalgary.ca/tsenkova/files/tsenkova/HousingIndicators.pddf.pdf>
- Burchell, R. W.; Lowenstein, G.; Dolphin, W. R.; Galley, C. C.; Downs, A.; Seskin, S.; Moore, T. 2002. *Costs of sprawl – 2000*. Washington, DC: Transportation Research Board, 2002. 65 p.
- Burke, T. 2004. *Measuring housing affordability*. Sydney: Australian Housing and Urban Research Institute, Swinburne-Monash Research Centre. 45 p.
- Buttonwood. 2010. A special case, *The Economist* 396/8695 (14-20/8/2010), p. 157.
- Capozza, D. R.; Green, R. K.; Hendershott, P. H. 1996. *Taxes, mortgage borrowing and house prices*. Wisconsin-Madison CULER Working Paper No. 96-06, University of Wisconsin, Center for Urban Land Economic Research.
- Cardarelli, R.; Monacelli, T.; Rebucci, A.; Sala, L. 2009. *Housing finance, housing shocks and the business cycle: Evidence from OECD countries*. Discussion Paper. Seminar: Fifth Workshop of the Latin American Finance, 2009. 5 p.

- Carmona, N.; Sieh, L. 2005. Performance measure innovation in English planning authorities, *Planning Theory & Practice* 6(3): 303–333.
- Caruana, J. 2005. *Monetary policy, financial stability and asset prices*. Occasional Papers. No 0507. Bank of Spain, Spain.
- Case, K. E. 2000. Real estate and the macroeconomy, *Brookings Papers on Economic Activity* 20(2): 119–162.
- Case, K. E.; Quigley, J. M.; Shiller, R. J. 2005. Comparing wealth effects: the stock market versus the housing market, *Advances in Macroeconomics* 5(1): 1–32.
- Case, K. E.; Quigley, J. M.; Shiller, R. J. 2012. *Wealth effects revisited 1975–2012*. Cowles Foundation Discussion Paper No. 1884. Yale University, USA.
- Case, K. E.; Shiller, R. J. 2003. Is there a bubble in the housing market?, *Brookings Papers on Economic Activity* 2: 299–342.
- Case, K.; Shiller, R.; Thompson, A. 2012. *What have they been thinking? Home buyer behavior in hot and cold markets*. NBER Working Paper No.18400. Cambridge: National Bureau of Economic Research. 46 p.
- Catte, P.; Girouard, N.; Price, R.; André, C. 2004. *Housing markets, wealth and the business cycle*. OECD Working Paper. No. 394.
- CEBS. 2010. *2010 EU wide stress testing documents* [online], [cited 10 May 2015]. Available from Internet: <http://www.eba.europa.eu/EuWideStressTesting.aspx>.
- Ceron, J. A.; Suarez, J. 2006. *Hot and cold housing markets: international evidence*. CEPR Discussion Papers, 2006. No 5411.
- Chaplin, R.; Martin, S.; Yang, J. H.; Whitehead, C. 1994. *Affordability: definitions, measures and implications for lenders*. Cambridge: University of Cambridge, Department of Land Economy. 42 p.
- Chaplin, R.; Martin, S.; Yang, J. H.; Whitehead, C. 1994. *Affordability: definitions, measures and implications for lenders*. University of Cambridge, Department of Land Economy: Cambridge, UK. 47 p.
- Chen, M.-C.; Kawaguchi, Y.; Patel, K. 2004. An analysis of the trends and cyclical behaviours of house prices in the Asian markets, *Journal of Property Investment & Finance* 22(1): 55–75.
- Cheng, I.; Raina, S.; Xiong, W. 2013. Wall Street and the housing bubble. NBER Working Paper No. 18904, *American Economic Review* 104(9): 2797–2829.
- Cheshire, P. 2009. *Urban containment, housing affordability, price stability – Irreconcilable goals* [online], [cited 12 May 2015]. Available from Internet: <http://www.sjcapitalgroup.com/publications/Urban%20containment%20housing%20affordability%20and%20price%20stability.pdf>
- Cheshire, P. 2010. *Urban land markets and policy failures* [online], [cited 10 May 2015]. Available from Internet: http://www.bis.gov.uk/assets/bispartners/foresight/docs/land-use/luf_report/dis02_urban_land_market_and_policy_failures.pdf.
- Cheshire, P.; Sheppard, S. 2005. The introduction of price signals into land use planning decision-making: a proposal, *Urban Studies* 42(4): 647–663.
- Cheshire, P.; Sheppard, S. 2004. Land markets and land market regulation: progress towards understanding, *Regional Science and Urban Economics* 34(6): 619–637.

- Chinloy, P. 1996. Real estate cycles and empirical evidence, *Journal of Housing Research* 7(2): 173–190.
- Chiquier, L.; Hassler, O.; Lea, M. 2004. *Mortgage securities in emerging markets*. World Bank Policy Research Working Paper. No 3370.
- Chiu, R. L. H. 2007. Planning, land and affordable housing in Hong Kong, *Housing Studies* 22(1): 63–81.
- Chiuri, M.; Jappelli, T. 2003. Financial market imperfections and home ownership: a comparative study, *European Economic Review* 47: 857–875.
- Ciaian, P.; Swinnen J. F. M. 2006. Land market imperfections and agricultural policy impacts in the New EU Member States: A partial equilibrium analysis, *American Journal of Agricultural Economics* 88(4): 799–815.
- Ciaian, P.; Swinnen, J. 2007. *Credit market imperfections and the distribution of policy rents: The common agricultural policy in the new EU Member States*, LICOS Discussion Paper 183/2007.
- Ciaian, P.; d'A Kancs. 2009. *The capitalization of area payments into farmland rents: Theory and evidence from the New EU Member States*. EERI Research Paper Series 04/2009, EERI, Brussels.
- Ciaian, P.; Swinnen J. F. M. 2009. Credit market imperfections and the distribution of policy rents, *American Journal of Agricultural Economics* 91(4): 1124–1139.
- Ciaian, P.; d' A. Kancs; Paloma, S. G. 2010a. *Distributional effects of CAP Subsidies: Micro evidence from the EU*. EERI Research Paper Series 05/2010, EERI, Brussels.
- Ciaian, P.; d' A. Kancs; Swinnen, J. F. M. 2010b. *EU land markets and the common agricultural policy*. CEPS, Brussels. 35 p.
- Ciaian, P.; d'Artis K. Swinnen, J.; Van Herck, K.; Vranken, L. 2012a. *Institutional factors affecting agricultural land markets*. Factor Markets, Working Paper. No. 16, February 2012. 22 p.
- Ciaian, P.; d' A. Kancs; J. Swinnen, Van Herck, K.; Vranken, L. 2012b. *Key issues and developments of farmland sales markets*. Factor Markets Working Paper No. 12, CEPS, Brussels.
- Ciaian, P.; d' A. Kancs; J. Swinnen, Van Herck, K.; Vranken, L. 2012c. *Sales market regulations for agricultural land in EU Member States and candidate countries*. Factor Markets Working Paper No. 14, CEPS, Brussels.
- Ciaian, P.; d' A. Kancs; J. Swinnen, Van Herck, K.; Vranken, L. 2012d. *Rental market regulations for agricultural land in EU Member States and candidate countries*. Factor Markets Working Paper No. 15, CEPS, Brussels.
- Civil Code of the Republic of Lithuania*. Valstybės žinios, 2000, No. 74-2262.
- Claessens, S.; Dell'Ariccia, G.; Igan, D.; Laeven, L. 2010. Cross-country experiences and policy implications from the global financial crisis, *Economic Policy* 25: 267–293.
- Claessens, S.; Kose, M. A.; Terrones, M. E. 2008. *What happens during recessions, crunches and busts?* IMF Working Paper No. 08/274.
- Clapham, D. 2006. Housing policy and the discourse of globalization, *European Journal of Housing Policy* 6(1): 55–76.
- Clark, S. P.; Coggin, T. D. 2011. Was there a U.S. house price bubble? An econometric analysis using national and regional panel data, *The Quarterly Review of Economics and Finance* 51: 189–200.

- Clark, W. A. V. 2005. *Modelling housing market search*. London: Croom Helm. 82 p.
- Clayton, J.; Miller, N.; Peng, L. 2010. Price–volume correlation in the housingmarket: causality and co-movements, *Journal of Real Estate Finance and Economics* 40: 14–40.
- Cochrane, J. H. 2011. Discount rates (Presidential address), *Journal of Finance* 66: 1047–1108.
- Coleman V, M.; Lacour-Little, M.; Vandell, K. D. 2008. Subprime lending and the housing bubble: Tail wags dog?, *Journal of Housing Economics* 17: 272–290.
- Constitution of the Republic of Lithuania*. Valstybės žinios, 1992, No. 33-1014.
- Costello, G.; Fraser, P.; Groenewold, N. 2011. House prices, non-fundamental components and interstate spillovers: the Australian experience, *Journal of Banking & Finance* 35: 653–669.
- Cox, W. 2011a. Housing constraints, natural and regulatory, *Economy Journal Watch*, January 2011. 5 p.
- Cox, W. 2011b. *The housing crash and smart growth*. National Center for Policy Analysis [online], [cited 12 May 2015]. Available from Internet: <http://www.ncpa.org/pdfs/st335.pdf>
- Craig Hall. 2004. *Timing the real estate market: how to buy low and sell high in real estate*. 3rd Editon. New York : McGraw Hill. 300 p.
- Crowe, C.; Dell’Ariccia, G.; Igan, D.; Rabanal, P. 2011. *How to deal with real estate booms: Lessons from country experiences*. IMF Working Paper. 62 p.
- Crowe, C.; Dell’Ariccia, G.; Igan, D.; Rabanal, P. 2012. *Policies for macrofinancial stability: Managing real estate booms and busts* [online], [cited 11 May 2015]. Available from Internet: <http://www.imf.org/external/np/seminars/eng/2012/fincrisis/pdf/ch12.pdf>
- Crowe, N. 1997. *Nature and the idea of a man-made World: An investigation into the evolutionary roots of form and order in the built environment*. The MIT Press. 290 p.
- Daugalienė, V. 2007. Land consolidation in Lithuania, in *Baltijos šalių žemėtvarka*. Vilnius: Akademija, 77–79 (in Lithuanian).
- Davis, M. A.; Heathcote, J. 2005. Housing and the business cycle, *International Economic Review* 46: 751–784.
- Davulis, G. 2012. Global crisis and economic processes in Lithuania and other Baltic countries, *Business Systems and Economics* 2(1): 134–147.
- Dawkins, C. J.; Nelson, A. C. 2002. Urban containment policies and housing prices: an international comparison with implications for future research, *Land Use Policy* 19(1): 1–12.
- de La Paz, P. T. 2003. Determinants of housing prices in Spanish cities, *Journal of Property Investment and Finance* 21(2): 109–135.
- De Nicolo, G.; Dell’Ariccia, G.; Laeven, L.; Valencia, F. 2010. *Monetary policy and risk taking*. IMF Staff Position Note No. 2010/09.
- de Wit, E. R.; Englund, P.; Francke, M. K. 2013. Price and transaction volume in the Dutch housing market, *Regional Science and Urban Economics* 43: 220–241.
- Demographia. 2015. *The association between prescriptive land use regulation and higher house prices: Literature review on smart growth, growth management, livability, urban containment and compact city policy* [online], [cited 10 May 2015]. Available from Internet: <http://www.demographia.com/db-dhi-econ.pdf>.
- Detken, C.; Smets, F. 2004. *Asset prices booms and monetary policy*. ECB Working Paper. 364 p.

- Diaz, A.; Jerez, B. 2010. *House prices, sales, and time on the market: a search-theoretic framework*. Working paper. Universidad Carlos III, Madrid, Spain.
- Diba, B. T.; Grossman, H. L. 1988. Explosive rational bubbles in stock prices?, *American Economic Review* 78: 520–530.
- Doherty, J. 2004. European housing policies: bringing the state back in?, *European Journal of Housing Policy* 4(3): 253–260.
- Doing Business. 2015. *Registering property in Lithuania* [online], [cited 10 May 2015]. Available from Internet: <http://www.doingbusiness.org/data/exploreeconomies/lithuania/registering-property/>.
- Dokko, Y.; Edelstein, R. H.; Lacayo, A. J.; Lee, D. C. 1999. Real Estate Income and Value Cycles: A Model of Market Dynamics, *Journal of Real Estate Research* 18(1): 69–95.
- Dooley, M.; Hutchison, M. 2009. Transmission of the U.S. subprime crisis to emerging markets: evidence on the decoupling recoupling hypothesis, *Journal of International Money and Finance* 28: 1331–1349.
- Downs, A. 1992. Satan or savior: 1. Regulatory barriers to affordable housing, *Journal of the American Planning Association* 58(4): 419–422.
- Downs, A. 1994. *New visions for metropolitan America*. Brookings Institution Press. 272 p.
- Downs, A. 2002. Have housing prices risen faster in Portland than elsewhere, *Housing Policy Debate* 13(1): 22–34.
- Duca, J. V.; Muellbauer, J.; Murphy, A. 2010. *House prices and credit constraints: Making sense of the U.S. experience*. Oxford University Working Paper, Oxford, USA.
- Dunsky, R. M.; Follain, J. R. 2000. Tax-induced portfolio reshuffling: The case of the mortgage interest deduction, *Real Estate Economics* 28: 683–718.
- Duvivier, D.; Gaspard, F.; de Frahan, B. H. 2005. A panel data analysis of the determinants of farmland price: An application to the effects of the 1992 CAP reform in Belgium, in the 11th EAAE Congress on “The Future of Rural Europe in the Global Agri-Food System”, 23–27 August 2005, Copenhagen, Denmark. 16 p.
- Economist. 2005. *The global housing boom*, June 16th 2005.
- EEA (European Environment Agency). 2010. *Land in Europe: prices, taxes and use patterns*. Technical Report No.4. [interaktyvus]. [žiūrėta 2015 02 10]. Prieiga internete: http://www.eea.europa.eu/publications/land-in-europe/at_download/file
- Eggertsson, G.; Krugman, P. 2012. Debt, deleveraging, and the liquidity trap: a fisher-minsky-koo approach, *Quarterly Journal of Economics* 127(3): 1469–1513.
- Eicher, T. 2008a. *Municipal and statewide land use regulations and housing prices across 250 major US cities* [online], [cited 15 May 2015]. Available from Internet: http://depts.washington.edu/teclass/landuse/housing_020408.pdf
- Eicher, T. 2008b. *Housing prices and land use regulations: A study of 250 major US cities* [online], [cited 15 May 2015]. Available from Internet: <http://depts.washington.edu/teclass/landuse/Housing051608.pdf>.
- Engelhardt, G. V. 2003. Nominal loss aversion, housing equity constraints, and household mobility: evidence from the United States, *Journal of Urban Economics* 53: 171–195.
- Englund, P.; Ioannides, Y. M. 1997. House price dynamics: an international empirical perspective, *Journal of Housing Economics* 6: 119–136.

- Engsted, T.; Pedersen, T. Q. 2013. *Predicting returns and rent growth in the housing market using the rent-to-price ratio: evidence from OECD countries*. Working Paper. Aarhus: Aarhus University. 15 p.
- Engsted, T.; Pedersen, T. Q. 2015. Predicting returns and rent growth in the housing market using the rent-price ratio: Evidence from the OECD countries, *Journal of International Money and Finance* 53: 257–275.
- EPRA. 2012. *Real estate in the real economy*. European Public Real Estate Association. 8 p.
- Esping-Andersen, G. 1990. *The three worlds of welfare capitalism*. Cambridge: Polity Press. 260 p.
- EurActive. 2015. *Survey: Minimum wages uneven in EU* [online], [cited 10 May 2015]. Available from Internet: <http://www.euractiv.com/sections/social-europe-jobs/minimum-wage-lives-its-name-many-eu-member-states-survey-312455>.
- EUROMIG. 2015. *Construction industry in Lithuania, advantages and perspectives* [online], [cited 10 May 2015]. Available from Internet: <http://www.euromig.com/construction-industry-in-lithuania-advantages-and-perspectives/>
- European Commission (EC). 2015. *Land administration and cadastre in Lithuania* [online], [cited 11 May 2015]. Available from Internet: https://ec.europa.eu/europeaid/land-administration-and-cadastre-lithuania_en.
- European Commission. 2012. *Alert Mechanism Report 2013*. European Commission. Brussels.
- Eurostat. 2010. *Agricultural census 2010* [online], [cited 10 May 2015]. Available from Internet: http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_census
- Eurostat. 2013. *Real estate activity statistics – NACE Rev. 2* [online], [cited 10 May 2015]. Available from Internet: http://ec.europa.eu/eurostat/statistics-explained/index.php/Real_estate_activity_statistics_-_NACE_Rev._2
- Eurostat. 2014a. *Housing conditions* [online], [cited 10 May 2015]. Available from Internet: http://ec.europa.eu/eurostat/statistics-explained/index.php/Housing_conditions.
- Eurostat. 2014b. *Housing price statistics – house price index* [online], [cited 10 May 2015]. Available from Internet: http://ec.europa.eu/eurostat/statistics-explained/index.php/Housing_price_statistics_-_house_price_index.
- Eurostat. 2015. *Turnover statistics for construction (NACE Rev. 2, F)* [online], [cited 10 May 2015]. Available from Internet: http://ec.europa.eu/eurostat/web/products-datasets/-/sbs_turn_con_r2.
- Fadiga, M. L.; Wang, Y. 2009. A multivariate unobserved component analysis of US housing market, *Journal of Economics and Finance* 33: 13–26.
- Favilukis, J.; Ludvigson, S. C.; van Nieuwerburgh, S. 2012. *The macroeconomic effects of housing wealth, housing finance, and limited risk-sharing in general equilibrium*. Working Paper, New York University, USA.
- Federal Reserve Bank of Dallas. 2008. *Neither boom nor bust, how Houston's housing market differs from nations*. Houston Business [online], [cited 12 May 2015]. Available from Internet: <http://www.dallasfed.org/research/houston/2008/hb0801.pdf>
- Field, C. G. 1997. Building consensus for affordable housing, *Housing Policy Debate* 8: 801–832.
- Fischel, W. 1995. *Regulatory takings, law, economics and politics*. Cambridge, MA: Harvard University Press. 415 p.
- Fisher, L. M.; Pollakowski, H. O.; Zabel, J. 2009. Amenity-based housing affordability indexes, *Real Estate Economics* 37: 705–746.

- Fitzpatrick, T.; McQuinn, K. 2007. House prices and mortgage credit: empirical evidence for Ireland, *The Manchester School* 75: 82–103.
- Floyd, J. E. 1965. The effects of farm price supports on returns to land and labour in agriculture, *Journal of Political Economy* 73: 148–158.
- Follain, J. R.; Velz, O. T. 1995. Incorporating the number of existing home sales into a structural model of the market for owner-occupied housing, *Journal of Housing Economics* 4: 93–117.
- Food and Agriculture Organization of the United Nations (FAO). 2015. *Experiences with land consolidation and land banking in Central and Eastern Europe after 1989*. Land Tenure, Working Paper No 26. 138 p.
- Freeman, A.; Chaplin, R.; Whitehead, C. 1997. *Rental affordability: A review of international literature*. Discussion Paper No. 88. Department of Land Economy, Cambridge University: Cambridge, UK.
- Gabriel, M.; Jacobs, K.; Arthurson, K.; Burke, T.; Yates, J. 2005. *Conceptualising and measuring the housing affordability problem*. National Research Venture 3: Housing affordability for lower income Australians Research Paper No. 1, Australian Housing and Urban Research Institute. 15 p.
- Galinienė, B. 2015. *Turto ir verslo vertinimo sistemos transformacijos*. Vilnius: VU. (in Lithuanian). 352 p.
- Galinienė, B.; Marčinskis, A.; Malevskienė, S. 2006. The cycles of real estate market in the Baltic Countries, *Technological and Economic Development of Economy* 12(2): 161–167.
- Gallin, J. 2003. *The long-run relationship between house prices and income: evidence from local housing markets*. United States Federal Reserve Board, USA. 55 p.
- Gallin, J. 2008. The long-run relationship between house prices and rents, *Real Estate Economics* 36: 635–658.
- Garber, P. 2000. *Famous first bubbles: The fundamentals of early manias*. MIT Press. 176 p.
- Garcia-Herrero, A.; de Lis, S. F. 2008. *The housing boom and bust in Spain: Impact of the securitisation model and dynamic provisioning*. BBVA Working Paper No. 0808.
- Gardner, B. L. 2002. *US commodity policies and land prices*. WP02-02, Department of Agricultural and Resource Economics, University of Maryland, College Park, USA.
- Garriga, C. 2010. *The role of construction in the housing boom and bust in Spain*. FEDEA Working Papers 2010-09.
- Gaudėšius, R. 2011. Sustainable land consolidation in Lithuania – the second wave of Land Reform, *Environmental Research, Engineering and Management* 3(57): 39–45.
- Geipele, I.; Kauškalē, L. 2013. The influence of real estate market cycle on the development in Latvia, *Procedia Engineering* 57: 327–333.
- Gelain, P.; Lansing, K.; Mendicino, C. 2013. House prices, credit growth, and excess volatility: implications for monetary and macroprudential policy, *International Journal of Central Banking* 9(2): 219–276.
- Genesove, D.; Han, L. 2011. *Measuring the thinness of real estate markets*. Working paper. Hebrew University of Jerusalem and University of Toronto, Canada.
- Genesove, D.; Myer, C. 2001. Loss aversion and seller behavior: Evidence from the housing market, *Quarterly Journal of Economics* 116: 1233–1260.

- Gerdesmeier, D.; Reimers, H. E.; Roffia, B. 2009. *Asset price misalignments and the role of money and credit*. ECB Working Paper. 1068 p.
- Gerdvilis, V. 2007. Šiuolaikinio gyvenamo būsto funkcinė struktūra *Lietuvoje* [Contemporary housing functional structure in Lithuania]. Doctoral thesis. Vilnius: Vilniaus Gedimino technikos universitetas. (in Lithuanian).
- Gilchrist, S.; Leahy, J. V. 2002. Monetary policy and asset prices, *Journal of Monetary Economics* 49(1): 75–97.
- Giuliodori, M. 2005. The role of house prices in the monetary transmission mechanism across European countries, *Scottish Journal of Political Economy* 52: 519–543.
- Glaeser, E. L. 2009. The wealth of cities: Agglomeration economies and spatial equilibrium in the search model, *American Economic Review, Papers and Proceedings* 99: 466 – 477.
- Glaeser, E. L.; Gyourko, J.; Saiz, A. 2008. Housing supply and housing bubbles, *Journal of Urban Economics* 64: 198–217.
- Glaeser, E. L.; Gyourko, J. 2008. *Rethinking federal housing policy: How to make housing plentiful and affordable*. American Enterprise Institute. 78 p.
- Glaeser, E. L.; Gyourko, J.; Saks, R. 2005. Why is Manhattan so expensive? Regulation and the rise in housing prices, *Journal of Law and Economics* 48(2): 331–369.
- Glaeser, E. L.; Schuetz, J.; Ward, B. 2006. *Regulation and the rise of housing prices in Greater Boston*. White Paper, Rappaport Institute Harvard University.
- Glaeser, E. L.; Ward, B. A. 2009. The causes and consequences of land use regulation: evidence from Greater Boston, *Journal of Urban Economics* 65: 265–278.
- Gleeson, B.; Memon, A. 1994. Reforming planning legislation: a New Zealand perspective, *Urban Policy and Research* 12(2): 82–90.
- Golob, K.; Bastic, M.; Psunder, I. 2012. Analysis of impact factors on the real estate market: Case Slovenia, *Inžinerinė Ekonomika – Engineering Economics* 23(4): 357–367.
- Goodhart, C. 1995. Price stability and financial fragility, in K. Sawamoto, N. Nakajima, H. Taguchi (Eds). *Financial stability in a changing environment*. London: Macmillan, 439–510.
- Goodhart, C.; Hofmann, B. 2008. *House prices, money, credit and the macroeconomy*. Working Paper Series 888. European Central Bank.
- Goodman, A. C.; Thibodeau, T. G. 2008. Where are the speculative bubbles in the US housing markets?, *Journal of Housing Economics* 17(2): 117–137.
- Goodwin, B. K.; Mishra, A. K.; Ortalo-Magné, F. N. 2003. What's wrong with our models of agricultural land value?, *American Journal of Agricultural Economics* 85(3): 744–752.
- Gordy, M. B.; Howells, B. 2006. Procyclicality in Basel II: Can we treat the disease without killing the patient?" *Journal of Financial Intermediation* 15: 395–417.
- Grebler, L.; Burns, L. 1982. Construction cycles in the United States since World War II, *Journal of the American Real Estate and Urban Economics Association* 10(2): 123–151.
- Green, R. K.; Malpezzi, S. 2003. *A primer on U. S. housing markets and housing policy*. Urban Institute Press, USA. 148 p.
- Greenspan, A. 2002. *Economic volatility*. Remarks at a symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, WY, August 30 [online], [cited 11 May 2015]. Available from Internet: <http://www.federalreserve.gov/boarddocs/speeches/2002/20020830/#f2>

- Grimes, A. C. 2007. *Housing supply in the Auckland region*. Center for Housing Research Aotearoa New Zealand [online], [cited 12 May 2015]. Available from Internet: <http://www.hnzc.co.nz/chr/pdfs/housing-supply-in-the-auckland-region-2000-2005.pdf>.
- Gudienė, N.; Banaitis, A.; Banaitienė, N. 2013. Evaluation of critical success factors for construction projects – an empirical study in Lithuania, *International Journal of Strategic Property Management* 17(1): 21–31.
- Guerrieri, V., Lorenzoni, G. 2011. Credit crises, precautionary savings and the liquidity trap. Working Paper. 55 p.
- Guiso, L.; Haliassos, M.; Jappelli, T. 2003. Household stockholding in Europe: Where do we stand and where do we go? *Economic Policy* 18(36): 123–170.
- Guo, F.; Chen, C. R.; Huang, Y. S. 2011. Markets contagion during financial crisis: a regime-switching approach, *International Review of Economics & Finance* 20: 95–109.
- Guo, J.; Yuan, J.; Chen, H. 2011. Analysis on the influences of local economic growth about real estate in Jilin, *Energy Procedia* 11: 3406–3414.
- Gurskienė, V.; Miknius, A. 2005. Consolidation of farms in Kėdainiai district, in *Transactions of Estonian University of Life Sciences – Baltic Surveying'05*, 50–57.
- Guyomard, H.; Le Mouél, C.; Gohin, A. 2004. Impacts of alternative agricultural income support schemes on multiple policy goals, *European Review of Agricultural Economics* 31(2): 125–148.
- Gyourko, J.; Saiz, A.; Summers, A. 2008. A new measure of the local regulatory environment for housing markets: the Wharton residential land use regulatory index, *Urban Studies* 45: 693–729.
- Gyourko, J.; Summers, A. 2006. Residential land use regulation in the Philadelphia. MSA. Wharton Working Papers. 62 p.
- Haffner, M.; Heylen, K. 2011. User costs and housing expenses towards a more comprehensive approach to affordability, *Housing Studies* 26: 593–614.
- Hall, P.; Thomas, R.; Gracey, H.; Drewett, R. 1973. *The containment of urban England: The planning system: objectives, operations, impacts*. George Allen & Unwin. 464 p.
- Han, I. 2010. Update – the reform in planning, *Planning (IAP)* 7(2): 12–15.
- Hancock, K. E. 1993. Can pay? Won't pay? or economic principles of “affordability”, *Urban Studies* 30: 127–145.
- Harding, D.; Pagan, A. 2002. Dissecting the cycle: a methodological investigation, *Journal of Monetary Economics* 49: 365–381.
- Hartvigsen, M. 2005. Land consolidation pilot projects in Eastern Europe, in *International Land Consolidation Conference*, December 1–2 2005, Budapest, Hungary. 5 p.
- Hartvigsen, M. 2014. Land mobility in a Central and Eastern European land consolidation context, *Nordic Journal of Surveying and Real Estate Research* 10(1): 23–46.
- Harvard University. 2015. *Basic real estate economics (Chapter 2)* [online], [cited 9 may 2015]. Available from Internet: http://isites.harvard.edu/fs/docs/icb.topic1143374.files/Rena_Chap%202.pdf
- Harvey, J.; Jowsey, E. 2003. *Urban land economics*. 6th ed. Palgrave Macmillan. 480 p.
- Haurin, D.; Haurin, J.; Nadauld, T.; Sanders, A. 2010. List prices, sale prices, and marketing time: an application to U.S. housing markets, *Real Estate Economics* 38: 659–686.

- Hegedus, J.; Mayo, S.; Tosics, I. 1996. Transition of the housing sector in the East Central European countries, *Review of Urban & Regional Development Studies* 8: 101–136.
- Hegedüs, J.; Struyk, R. J. 2005. *Housing finance: New and old models in Central Europe, Russia, and Kazakhstan*. Local Government and Public Service Reform Initiative. Open Society Institute, Budapest.
- Hegedus, J.; Teller, N. 2005. Development of the housing allowance programmes in Hungary in the context of CEE transitional countries, *International Journal of Housing Policy* 5(2): 187–209.
- Heiskanen, R. 1993. The banking crisis in the Nordic countries, *Kansallis Economic Review* 2: 13–19.
- Hendershott, P. H.; Pryce, G.; White, M. 2003. Household leverage and the deductibility of home mortgage interest: Evidence from U.K. house purchases, *Journal of Housing Research* 14: 49–82.
- Himmelberg, C.; Mayer, C.; Sinai, T. 2005. Assessing high house prices: bubbles, fundamentals and misperceptions, *Journal of Economic Perspectives* 19: 67–92.
- Ho, L. S.; Wong, G. 2008. Nexus between housing and themacro economy: the Hong Kong case, *Pacific Economy Review* 13: 223–239.
- Hoekstra, J. 2003. Housing and the welfare state in the Netherlands: An application of Esping-Andersen's typology, *Housing, Theory and Society* 20(2): 58–71.
- Hofmann, B. 2004. The determinants of private sector credit in industrialised countries: do property prices matter? *International Finance* 7: 203–234.
- Holcombe, R. G. 2013. Planning and the invisible hand: allies or adversaries? *Planning Theory* 12(2): 199–210.
- Hort, K. 2000. Prices and turnover in the market for owner-occupied homes, *Regional Science and Urban Economics* 30: 99–119.
- Huang, H.; Tang, Y. 2012. Residential land use regulation and the US housing price cycle between 2000 and 2009, *Journal of Urban Economics* 71: 93–99.
- Huber, W.; Messic, L. P.; Pivar, W. 2011. *Real estate economics*. 5th ed. Covina, CA: Educational Textbook Company, Inc. 556 p.
- Hulchanski, J. D. 1995. The concept of housing affordability: Six contemporary uses of the housing expenditure-to-income ratio, *Housing Studies* 10: 471–491.
- Hwang, M.; Quigley, J. 2006. Economic fundamentals in local housing markets: evidence from US metropolitan regions, *Journal of Regional Science* 46(3): 425–453.
- HYPOSTAT. 2013. *Housing and mortgage markets in 2012*. European Mortgage Federation, Brussels. 78 p.
- Iacovello, M.; Minetti, R. 2003. Financial liberalization and the sensitivity of house prices to monetary policy: theory and evidence, *The Manchester School* 71(1): 20–34.
- Iacoviello, M.; Neri, S. 2010. Housing market spillovers: evidence from an estimated DSGE mode, *American Economic Journal: Macroeconomics* 2: 125–164.
- Igan, D.; Kabundi, A. N.; Nadal-De Simone, F.; Pinheiro, M.; Tamirisa, N. T. 2009. *Three cycles: housing, credit, and real activity*. IMF Working Paper No. 09/231.
- Igan, D.; Loungani, P. 2011. *Global housing cycles*. IMF Working Paper. IMF, 2006, World Economic Outlook: Globalization and Inflation (Chapter 3. How Has Globalization Affected Inflation?), International Monetary Fund, Washington, DC.

- Ihlanfeldt, K. R. 2007. The effect of land use regulation on housing and land prices, *Journal of Urban Economics* 61(3): 420–435.
- Ihlanfeldt, K. R. 2009. Does comprehensive land use planning improve cities? *Land Economics* 85(1): 51–73.
- IMF. 2009. *World economic outlook: Sustaining the recovery* (Chapter 3. Lessons for Monetary Policy from Asset Price Fluctuations), International Monetary Fund, Washington, DC.
- IMF. 2010. *World economic outlook: Recovery, risk, and rebalancing*. International Monetary Fund, Washington, DC.
- IMF. 2011. *Global financial stability report*. International Monetary Fund, Washington, DC.
- Ivanauskas, F.; Eidukevičius, R.; Marčinskas, A.; Galinienė, B. 2008. Analysis of housing market in Lithuania, *International Journal of Strategic Property Management* 12: 271–280.
- Jaeger, A.; Schuknecht, L. 2007. Boom–bust phases in asset prices and fiscal policy behavior, *Emerging Markets Finance and Trade* 43(6): 45–66.
- Jasaitis, J. 2012. *Antropologinė strateginio valdymo metodologija. Skirtingo lygio vietovių strateginės plėtros kryptys* [Anthropological strategic management methodology. The different levels of areas of strategic development directions]. Collection of articles. Šiauliai: Šiaulių universitetas. (in Lithuanian).
- Johansen, A.; Sornette, D.; Ledoit, O. 1999. Predicting financial crashes using discrete scale invariance, *Journal of Risk and Uncertainty* 5: 5–32.
- Jonung, L.; Schuknecht, L.; Tujula, M. 2009. The boom and bust cycle in Finland and Sweden in an international perspective, in L. Jonung, J. Kiander, P. Vartia (Eds). *The Nordic Experience of Financial Liberalization*. Edward Elgar, 4–46.
- Jud, D.; Winkler, D. 2002. The dynamics of metropolitan housing prices, *Journal of Real Estate Research* 23(1): 29–45.
- Jurevičienė, D. 2007. Jaunų šeimų būsto programa ir darbo jėgos judėjimas [The problem of young families' housing and labour force movement], *Ekonomika* 79: 94–108. (in Lithuanian).
- Kaklauskas, A. 1999. *Multiple criteria decision support of building life cycle*. Research Report presented for Habilitation. Vilnius: Technika. 60 p.
- Kaklauskas, A.; Zavadskas, E. K.; Kelpšienė, L.; Kazokaitis, P. 2009a. Model for integrated construction and real estate crisis management, in *The 12th German-Lithuanian-Polish Colloquium "Sustainable Development in Civil Engineering and Multi-Attribute Decision Making: abstracts*, 20–24 May 2009, Vilnius, Lithuania/ Lithuanian Operational Research Society, Leipzig University of Applied Science. Vilnius : Technika, 21–22.
- Kaklauskas, A.; Zavadskas, E. K.; Raslanas, S. 2009b. Modelling of real estate sector: the case for Lithuania, *Transformations in Business & Economics* 8(1): 101–120.
- Kaklauskas, A.; Zavadskas, E. K.; Bagdonavičius, A.; Kelpšienė, L.; Bardauskienė, D.; Kutut, V. 2010. Conceptual modelling of construction and real estate crisis with emphasis on comparative qualitative aspects description, *Transformations in Business & Economics* 9(1): 42–61.
- Kaklauskas, A.; Kelpšienė, L.; Zavadskas, E. K.; Bardauskienė, D.; Kaklauskas, G.; Urbonas, M.; Sorakas, V. 2011. Crisis management in construction and real estate: Conceptual modeling at the micro-, meso- and macro-levels, *Land Use Policy* 28(1): 280–293.

- Kaklauskas, A.; Zavadskas, E. K.; Kazokaitis, P.; Bivainis, J.; Galinienė, B.; d'Amato, M.; Naimavičienė, J.; Urbanavičienė, V.; Vitas, A.; Čerkauskas, J. 2013. Crisis management model and recommended system for construction and real estate. Advanced methods for computational collective intelligence, in *4th International Conference on Computational Collective Intelligence Technologies and Applications (ICCCI 2012)*, Ho Chi Min City, Vietnam, November 28–30, 2012. Berlin Heidelberg: Springer. Vol. 457: 333–343.
- Kaklauskas, A.; Daniūnas, A.; Binkytė, A.; Kliukas, R.; Kazokaitis, P.; Kaklauskas, G.; Juozapaitis, A.; Banaitis, A.; Budrytė, L. 2015. Crisis thermometer for housing market recommendations, *Land Use Policy* 48: 25–37.
- Kaminsky, G.; Reinhart, C. 1999. The twin crises: the causes of banking and balance-of-payments problems, *American Economic Review* 89(3): 473–500.
- Karaś, M. 2014. Macro-prudential policy versus asset price bubbles in monetary union member states – The case of Spain, in É. Voszka, G. D. Kiss (Eds). *Crisis management and the changing role of the state*. University of Szeged Doctoral School in Economics, Szeged, 13–31.
- Kasparova, D.; White, M. 2001. The responsiveness of house prices to macroeconomic forces: a cross-country comparison, *European Journal of Housing Policy* 1(3): 385–416.
- Kasperavičius, R. 2015a. *Real property administration system in Lithuania. History, development, international experience and perspectives*. Vilnius: State Enterprise Centre of Registers. 188 p.
- Kasperavičius, R. 2015b. Land cadastre and register system in Lithuania, in *Conference on Property Valuation and Taxation for Fiscal Sustainability and Improved Local Government in Europe and Central Asia*, 3–5 June 2015, Vilnius, Lithuania. Presentation.
- Kavaliauskiene, B.; Tarvydiene, M. E. Problems and perspectives of land consolidation in Lithuania, *Transactions of Estonian University of Life Sciences – Baltic Surviving'11*, 91–98.
- Kazakevičius, Z. 2014. Changing conditions of Lithuania's land market formation and its effect of farmers' decision-making, *Management Theory and Studies for Rural Business and Infrastructure Development* 8: 280–288.
- Kazokaitis, P.; Kaklauskas, A.; Zavadskas, E. K.; Bivainis, J.; Galinienė, B.; Vitas, A. 2012. Construction and real estate crisis management model and recommended system, *International Journal of Civil and Structural Engineering* 1(1): 1–7.
- Keen, M.; Klemm, A.; Perry, V. 2010. Tax and the crisis, *Fiscal Studies* 31(1): 43–79.
- Kildienė, S.; Kaklauskas, A.; Zavadskas, E. K. 2011. COPRAS based comparative analysis of the European country management capabilities within the construction sector in the time of crisis, *Journal of Business Economics and Management* 12(2): 417–434.
- Kilian, S.; Anton, J.; Röder, N.; Salhofer, K. 2008. Impacts of 2003 CAP reform on land prices: From theory to empirical results, in *the 109th Seminar of European Association of Agricultural Economists*, 20–21 November 2008, Viterbo, Italy. No 2.3.4.
- Kim, K.-H.; Cho, M. 2010. Structural changes, housing price dynamics and housing affordability in Korea, *Housing Studies* 25(6): 839–856.
- Kindleberger, C. 2003. *Manias, panics, and crashes*. New York: Basic. 304 p.
- Kirwan, B. 2005. *The incidence of US agricultural subsidies on farmland rental rates*. Working Paper 05-04. Department of Agricultural and Resource Economics, University of Maryland, College Park.

- Knight, J. 2002. Listing price, time on the market, and ultimate selling price: causes and effects of listing price changes, *Real Estate Economics* 30: 213–237.
- Konieczna, J.; Trystuła, A. 2014. Real estate cadastre – new challenges, in *The 9th International Conference “Environment Engineering”*, 22–23 May 2014, Vilnius, Lithuania. Selected papers, 1–5.
- Kopeva, D. 2003. Land markets in Bulgaria, in FAO (Ed.). *Land reform, land settlement and cooperatives*. FAO, Rome, 41–58.
- Kopeva, D. 2003. Land markets in Bulgaria, in FAO (Ed.). *Land reform, land settlement and cooperatives*. Rome: FAO, 41–58.
- Krugman, P. 2005. That hissing sound, *The New York Times*, 8 August 2005.
- Krugman, P. 2006. No bubble trouble?, *The New York Times*, 8 January 2006.
- Kuang, P. 2014. A model of housing and credit cycles with imperfect market knowledge, *European Economic Review* 70: 419–437.
- Laeven, L.; Valencia, F. 2010. *Resolution of banking crises: The good, the bad, and the ugly*. IMF Working Paper No. 10/146.
- Lai, M. R.; Order, V. A. 2010. Momentum and house price growth in the United States: anatomy of a bubble, *Real Estate Economics* 38: 753–773.
- Lambertini, K.; Mendicino, C.; Punzi, M. T. Expectation-driven cycles in the housing market: Evidence from survey data, *Journal of Financial Stability* 9: 518–529.
- Land resources analysis. 2011. *Demand and supply of land resources* [online], [cited 10 May 2015]. Available from Internet: <https://landresourcesanalysis.wordpress.com/2011/07/05/demand-and-supply-of-land-resources/>
- Larsen, E. R.; Weum, S. 2008. Testing the efficiency of the Norwegian housing market, *Journal of Urban Economics* 64: 510–517.
- Latruffe, L.; Doucha, T.; Le Mouél, C.; Medonos, T.; Voltr, V. 2008. Capitalisation of government support in agricultural land prices in the Czech Republic, *Agricultural Economics* 54(10): 451–460.
- Law on Electronic Signature of the Republic of Lithuania*. Valstybės žinios, 2000, No. 61-1827; amendments 2013-12-17.
- Law on Fundamentals for Property and Business Valuation of the Republic of Lithuania*. Valstybės žinios, 1999, No. 52-1672; 2003, No. 38-1673; 2011, No. 86-4139.
- Law on Geodesy and Cartography of the Republic of Lithuania*. Valstybės žinios, 2001, No. 62-2226; 2010, No. 54-2649.
- Law on Inheritance Tax of the Republic of Lithuania*. Valstybės žinios, 2002, No. 123-5531.
- Law on Land of the Republic of Lithuania*. Valstybės žinios, 1994, No. 34-620; 1995, No. 53-1294; 1996, No. 100-2262; 1997, No. 66-1598; 1999, No. 64-2075; 2000, No. 42-1191, No. 58-1706; 2001, No. 71-2519; 2002, No. 74-3141, No. 102-4551; 2004, No. 28-868.
- Law on Land Reform of the Republic of Lithuania*. Valstybės žinios, 1991, No. 24-635; 1997, No. 69-1735.
- Law on Land Tax of the Republic of Lithuania*. Valstybės žinios, 1992, No. 21-612; amendments 2011-12-21.
- Law on Real Property Cadastre of the Republic of Lithuania*. Valstybės žinios, 2000, No. 58-1704; 2001, No. 16-497; 2003, No. 57-2530.

- Law on Real Property Register of the Republic of Lithuania*. Valstybės žinios, 1996, No. 100-2261; 1996, No. 100-2261; 1997, No. 65-1555, No. 98-2480; 1999, No. 101-2904; 2000, No. 58-1705; 2001, No. 55-1948.
- Law on State Registers of the Republic of Lithuania*. Valstybės žinios, 1996, No. 86-2043; 2004, No. 124-4488.
- Law on Tax Administration of the Republic of Lithuania*. Valstybės žinios, 2004, No. 63-2243; amendments 2014-03-20.
- Law on Territorial Planning of the Republic of Lithuania*. Valstybės žinios, 1995, No. 107-2391; 2004, No. 21-617; 2013, No. 76-3824.
- Law on the Notariate of the Republic of Lithuania*. Valstybės žinios, 1992, No. 28-810; amendments 2012-06-21.
- Law on the Procedure and Conditions of the Restoration of the Rights of Ownership to the Existing Real Property*. Valstybės žinios, 1997, No. 65-1558.
- Leduc, S.; Sill, K., 2013. Expectations and economic fluctuations: an analysis using survey data, *Review of Economics and Statistics* 95(4): 1352–1367.
- Leimontaite, G. 2013. *Land consolidation in EU rural development policy in Lithuania*. Powerpoint presentation for FAO land consolidation workshop in Skopje, 2013.
- Leishman, C.; Rowley, S. 2012. Affordable housing, in D. F. Clapham, A. V. Clarke, K. Gibb (Eds). *The Sage handbook of housing*. London: Sage, 379–396.
- Lence, S. H.; Mishra, A. K. 2003. The impacts of different farm programmes on cash rents, *American Journal of Agricultural Economics* 85(3): 753–761.
- Leonavičius, V.; Žilys, A. 2009. Gerovės valstybė ir moderniosios Lietuvos urbanizacija [Welfare state and contemporary urbanization in Lithuania], *Filosofija. Sociologija* 20(4): 318–325 (in Lithuanian).
- Lerman, B. R. 2006. Mandatory inclusionary zoning – the answer to the affordable housing problem, *Boston College Environmental Affairs Law Review* 33(2): 383–389.
- Lerman, Z.; Csaki, C.; Feder, G. 2004. *Agriculture in transition: Land policies and evolving farm structures in Post-Soviet countries*. Lanham, MD: Lexington Books. 254 p.
- Leung, C. 2004. Macroeconomics and housing: a review of the literature, *Journal of Housing Economics* 13: 249–267.
- Leunig, T. 2007. *In my back yard: Unlocking the planning system*. Centreforum [online], [cited 10 May 2015]. Available from Internet: <http://www.centreforum.org/assets/pubs/in-my-back-yard.pdf>.
- Levin, E. J.; Pryce, G. B. J. 2009. What determines the price elasticity of house supply? Real interest rate effects and cyclical asymmetries, *Housing Studies* 24: 713–736.
- Lind, H. 2008. *Price bubbles on the housing market: Concept, theory and indicators*. Working Paper No. 58. Section for Building and Real Estate Economics, Department of Real Estate and Construction Management, School of Architecture and the Built Environment, Royal Institute of Technology. 17 p.
- Ling, D.; Archer, W. 2012. *Real estate principles: A value approach*. McGraw-Hill/Irwin Series in Finance, Insurance and Real Estate. 2nd ed. New York: McGraw-Hill Education. 704 p.
- Lipnevič, A. 2012. Būsto politikos raida Lietuvoje [The development of housing policy in Lithuania], in M. Palmirani, E. Bilevičiūtė (Eds.). *Societal innovations for global growth*,

- stream D, improving life quality and enhancing employment possibilities*. Vilnius: Mykolo Romerio University, 1(1): 835–849. (in Lithuanian).
- Lipnevič, A. 2013. Daugiabučių namų savininkų bendrijų kūrimasis ir problemos Lietuvoje [The creation of homeowners' associations in Lithuania and their problems], *Tiltas į ateitį* 1(7): 32–36. (in Lithuanian).
- Lithuanian Institute of Agrarian Economics (LIAE). 2011a. *Abandoned land: Problems and solutions*. Scientific Study. Vilnius: LIAE. 53 p.
- Lithuanian Institute of Agrarian Economics (LIAE). 2011b. *The tendencies of rural development in Lithuania*. Scientific Study. Vilnius: LIAE. 62 p.
- Lux, M. 2003. Efficiency and effectiveness of housing policies in the Central and Eastern Europe countries, *European Journal of Housing Policy* 3(3): 243–265.
- MacLennan, D. 2008. *Housing for the Toronto economy*. Cities Centre Discussion Paper 216. University of Toronto, Toronto, USA.
- MacLennan, D. 2012. Understanding housing markets: Real progress or stalled agendas?, in D. F. Clapham; W. A. V. Clark; K. Gibb (Eds). *The SAGE handbook of housing studies*. Thousand Oaks, CA: SAGE Publications, Ltd., 5–25.
- MacLennan, D.; Williams, R. 1990. *Affordable housing in Britain and America*. Joseph Rowntree Foundation: England, UK. 92 p.
- Maksimov, S. N. 2003. Девелопмент (развитие недвижимости). Piter: zdatelskij dom "Piter". 256 p. (in Russian).
- Mallak L. A.; Lyth D. M.; Olson S. D.; Ulshafer S. M.; Sardone F. J. 2003. Culture, the built environment and healthcare organizational performance, *Managing Service Quality* 13(1): 27–38.
- Malpass, P.; Murie, A. 1990. *Housing policy and practice*. London: Macmillan Press Ltd. 320 p.
- Malpezzi, S. 1996. Housing prices, externalities, and regulation in U.S. metropolitan areas, *Journal of Housing Research* 7(2): 209–241.
- Malpezzi, S. 2005. Some international perspectives on affordable housing and possible lessons for Korea, *Housing Studies Review* 13(3): 209–221.
- Malpezzi, S.; Wachter, S. 2005. The role of speculation in real estate cycles, *Journal of Real Estate Literature* 3: 143–164.
- Manser, J. E. 2010. *Economics – A foundation course for the built environment*. London and New York: Taylor & Francis. 285 p.
- Martin, R.; Schuknecht, L.; Vansteenkiste, I. 2007. *The role of the exchange rate for adjustment in boom and bust episodes*. ECB Working Paper. 813 p.
- Mayer, C. J.; Somerville, C. T. 2000. Land use regulation and new construction, *Regional Science and Urban Economics* 30: 639–662.
- Mayer, C.; Pence, K.; Sherlund, S. M. 2008. *The rise in mortgage defaults*. FRB Finance and Economics Discussion Series No. 2008-59.
- Mayo, S. K. 2007. *Effects of land and housing policies on market performance*. Land Lines. Lincoln Institute of Land Policy, USA.
- McCarthy, J.; Peach, R. 2004. Are home prices the next bubble?, *FRBNY Economic Policy Review* December 2004, 1–17.

- McCord, M.; McGreal, S.; Berry, J.; Haran, M.; Davis, P. 2011. The implications of mortgage finance on housing market affordability, *International Journal of Housing Markets and Analysis* 4: 394–417.
- McKenzie, D. J.; Betts, R. M.; Jensen, C. A. 2010. *Essentials of real estate economics*. 6th ed. South-Western Educational Pub. 576 p.
- McQuinn, K.; O'Reilly, G. 2007. *A model of cross-country house prices*. Research Technical Papers 5/RT/07, Central Bank of Ireland.
- McQuinn, K.; O'Reilly, G. 2008. Assessing the role of income and interest rates in determining house prices, *Economic Modelling* 25: 377–390.
- Médaille, J. C. 2008. The fictitious commodities – Land, in *Equity and equilibrium: The political economy of distributism*, Chapter IX [online], [cited 10 May 2015]. Available from Internet: <http://distributism.blogspot.com/2008/07/chapter-xi-fictitious-commodities-land.html>.
- Meir-Brodnitz, M., Alexander, E. R. 2011. Editorial: Is the land-property market an ordinary Market? Mistakes in the land reform and how to fix them, *Planning(IAP)* 8(1): 127–136.
- Mian, A.; Sufi, A. 2011. House prices, home equity-based borrowing, and the US household leverage crisis, *American Economic Review* August, 2132–2156.
- Mikniūtė, A. 2013. *Būsto politika Lietuvoje* [Housing policy in Lithuania]. Viešojo administravimo magistro baigiamasis darbas. Vilnius: Mykolas Romeris universitetas. (in Lithuanian).
- Miles, W. 2015. Regional house price segmentation and convergence in the US: a new approach, *Journal of Real Estate Finance and Economics* 50: 113–128.
- Miller, N. G.; Sklarz, M. A. 1986. A note on leading indicators of housing market price trends, *Journal of Real Estate Research* 1: 99–109.
- Milligan, V.; Phibbs, P.; Fagan, K.; Gurran, N. 2004. *A practical framework for expanding affordable housing services in Australia: Learning from experience*. Final Report No. 65, Australian Housing and Urban Research Institute. 46 p.
- Milligan, V.; Phibbs, P.; Gurran, N.; Fagan, K. 2007. *Approaches to evaluation of affordable housing initiatives in Australia*. National Research Venture 3: Housing affordability for lower income Australians, Research Paper No. 7, Australian Housing and Urban Research Institute. 38 p.
- Ministry of Finance of the Republic of Lithuania. 2015. *Economic Development Scenario (20 March, 2015)* [online]. [cited 10 May 2015]. Available from Internet: http://www.finmin.lt/web/finmin/aktualus_duomenys/makroekonomika
- Mishkin, F. S. 2011. How should central banks respond to asset-price bubbles? The 'lean' versus 'clean' debate after the GFC, *RBA Bulletin*, June, 59–70.
- Moffat, S.; Kohler, N. 2008. Conceptualizing the built environment as a social-ecological system, *Building Research & Information* 36(3): 248–268.
- Moroni, S. 2010. Rethinking the theory and practice of land use regulation: towards nomocracy, *Planning Theory* 9(2): 137–155.
- Muellbauer, J.; Murphy, A. 1997. Booms and busts in the UK housing market, *Economic Journal* 107: 1701–1727.
- Muller, K. 2002. Old-age security in the Baltics: Legacy, early reform and recent trends, *Europe-Asia Studies* 54(4): 725–748.

- Mulliner, E.; Maliene, V. 2015. An analysis of professional perceptions of criteria contributing to sustainable housing affordability, *Sustainability* 7: 248–270.
- Mulliner, E.; Maliene, V. Criteria for sustainable housing affordability, in *Proceedings of the 8th International Conference on Environmental Engineering*, 19–20 May 2011, Vilnius, Lithuania, 966–973.
- Mulliner, E.; Smallbone, K.; Maliene, V. 2013. An assessment of sustainable housing affordability using multiple criteria decision making method, *Omega* 41(2): 270–279.
- National Land Consolidation Strategy of the Republic of Lithuania*. Valstybės žinios, 2008, No. 18-635.
- Ndubueze, O. 2007. Measuring housing affordability: A composite approach, in *Proceedings of the ENHR 2007 International Conference on Sustainable Urban Areas*, 25–28 June 2007, Rotterdam, The Netherlands. 43 p.
- Nelson, A. C.; Pendall, R.; Dawkins, C. J.; Knapp, G. J. 2002. *The link between growth management and housing affordability: The academic evidence*. Brookings Institution.
- Ngai, R.; Tenreiro, S. 2010. *Hot and cold seasons in the housing market*. Manuscript. London School of Economics. 58 p.
- Ngo, P. V. 2015. Household leverage, housing markets, and macroeconomic fluctuations, *Journal of Macroeconomics* 44: 191–207.
- Nofsinger, J. R. 2002. *Psychology of investing*. New Jersey: Prentice Hall Upper Saddle River. 160 p.
- Novy-Marx, R. 2009. Hot and cold markets, *Real Estate Economics* 37: 1–22.
- NUMBEO. 2014. *Housing indicators* [online], [cited 10 May 2015]. Available from Internet: <http://www.numbeo.com>
- Nuuter, T.; Lill, I.; Tupénaitė, L. 2015. Comparison of housing market sustainability in European countries based on multiple criteria assessment, *Land Use Policy* 42: 642–651.
- OECD. 2005. *Recent house price developments: The role of fundamentals*. OECD Economic Outlook 78 [online], [cited 10 May 2015]. Available from Internet: <http://www.oecd.org/dataoecd/41/56/35756053.pdf>.
- OECD. 2007. *Agricultural support, farmland values and sectoral adjustment. The implications for policy reform*. AGR/CA/APM(2006)19/final. Paris: OECD. 118 p.
- OECD. 2011. *Economy: Well functioning housing markets are key for stability and growth*. News Release, January 19, 2011 [online], [cited 10 May 2015]. Available from Internet: http://www.oecd.org/document/13/0,3746,en_21571361_44315115_46917325_1_1_1_1,00.html.
- Ooi, J. T. L.; Sirmans, C. F.; Turnbull, G. K. 2011. Government supply of land in a dual market, *Real Estate Economics* 39(1): 167–184.
- Ortalo-Magné, F.; Rady, S. 2006. Housing market dynamics: on the contribution of income shocks and credit constraints, *Review of Economic Studies* 73: 459–485.
- Osei, V. 2013. The construction industry and its linkage to the Ghanaian economy-policies to improve the sector's performance, *International Journal of Development and Economic Sustainability* 1(1): 56–72.
- Paciorek, A. 2013. Supply constraints and housing market dynamics, *Journal of Urban Economics* 77: 11–26.
- Paris, C. 2007. International perspectives on planning and affordable housing, *Housing Studies* 22(1): 1–9.

- Parker, J. A. 2000. Comments and discussion on: K. E. Case (2000), Real estate and the macroeconomy, *Brookings Papers on Economic Activity* 20(2): 150–158.
- Pašakarnis, G.; Malienė, V. 2010. Towards sustainable rural development in Central and Eastern Europe: applying land consolidation, *Land Use Policy* 27: 545–549.
- Pašakarnis, G.; Malienė, V. 2011. Land consolidation in Lithuania: aspiration and actuality, in *The 8th International Conference on Environmental Engineering*, 2011, Vilnius, Lithuania, 1424–1431.
- Pašakarnis, G.; Morley, D.; Maliene, V. 2013. Rural development and challenges establishing sustainable land use in Eastern European countries, *Land Use Policy* 30: 703–710.
- Patton, M.; Kostov, P.; McErlean, S.; Moss, J. 2008. Assessing the influence of direct payments on the rental value of agricultural land, *Food Policy* 33(5): 397–405.
- Pérez, J. M. G. 2010. The Real Estate and Economic Crisis: An Opportunity for Urban Return and Rehabilitation Policies in Spain, *Sustainability* 2: 1571–1601.
- Petkevicius, A. 2005. Lithuania, in R. Van Kempen, et al. (Eds). *Urban issues and urban policies in the new EU countries*. Aldershot: Ashgate, 183–205.
- Piazzesi, M.; Schneider, M. 2009. Momentum traders in the housing market: survey evidence and a search model, *American Economic Review* 99(2): 406–411.
- Pichler-Milanovich, N. 1997. The role of Baltic cities in the European urban system: Forgotten cities or important regional actors?, in M. Aberg and M. Peterson (Eds.). *Baltic cities: Perspective on urban and regional change in the Baltic Sea area*. Lund: Nordic Academic Press, 16–43.
- Plantinga, A. J.; Lubowski, R. N.; Stavins, R. N. 2002. The effects of potential land development on agricultural land prices, *Journal of Urban Economics* 52(3): 561–581.
- Plazzi, A.; Torous, W.; Valkanov, R. 2010. Expected returns and expected growth in rents of commercial real estate, *Review of Financial Studies* 23: 3469–3519.
- Polanska, D. V. 2011. *The emergence of enclaves of wealth and poverty. A sociological study of residential differentiation in post-communist Poland*. Doctoral thesis in sociology. New series 50. Stockholm: Stockholm University.
- Pritchett, C. 1977. The Effect of Regional Growth Characteristics on Regional Housing Prices, *Journal of the American Real Estate and Urban Economics Association* 5(2): 189–208.
- Procedure for the Determination of the Main Purpose of Land Use and Submission of the Applications to Change the Main Purpose of Land Use, Their Examination and Decision-making*. Approved by Resolution No 1073 by the Government of the Republic of Lithuania as of 29 September 1999.
- Publishers, Wiley-Blackwell. 2006. Bubble trouble – Are British house prices significantly overvalued?, *Economic Outlook* 30(2): 19–29.
- Pyhrr, S. A.; Born, W. L. 1994. Real estate valuation: The effect of market and property cycles, *Journal of Real Estate Research* 9(4): 455–486.
- Quigley, J. 2000. A decent home: housing policy in perspective, *Brookings Papers on Urban Affairs* 1(1): 53–99.
- Quigley, J. 2003. Is there a bubble in the housing market? Comment, *Brookings Papers on Economic Activity* 2: 354–359.
- Quigley, J. M. 2003. Transaction costs and housing markets', in A. J. O'Sullivan and K. D. Gibb (Eds). *Housing economics and public policy*. Oxford: Blackwell Publishing, 56 – 64.

- Quigley, J. M.; Raphael, S. 2004. Is housing unaffordable? Why isn't it more affordable?, *Journal of Economic Perspectives* 18: 191–214.
- Quigley, J. M.; Raphael, S. 2005. Regulation and the high cost of housing in California, *The American Economic Review* 95: 323–328.
- Quigley, J. M.; Rosenthal, L. 2005. The effects of land use regulation on the price of housing: What do we know? What can we learn, *Cityscape* 8: 69–138.
- Rakauskienė, O.; Krinickienė, G. 2009. The anatomy of global financial crisis, *Intellectual Economics* 2(6): 116–128.
- Rapoport, A. (Ed.). 1976. *The mutual interaction of people and their built environment: A cross-cultural perspective*. Chicago: Aldine. 505 p.
- Raslanas, S. 2004. Vilniaus miesto daugiaaukščio būsto rinkos vertės tyrimai, Ūkio technologinis ir ekonominis vystymas 10(4): 167–173 (in Lithuanian).
- Raslanas, S.; Alchimovienė, J.; Banaitienė, N. 2011. Residential areas with apartment houses: analysis of the condition of buildings, planning issues, retrofit strategies and scenarios, *International Journal of Strategic Property Management* 15(2): 152–172.
- Raslanas, S.; Zavadskas, E. K.; Kaklauskas, A. 2010a. Land value tax in the context of sustainable urban development and assesment. Part I - Policy analysis and conceptual model for the taxation system on real property, *International Journal of Strategic Property Management* 14(1): 73–86.
- Raslanas, S.; Zavadskas, E. K.; Kaklauskas, A.; Zabulėnas, A. 2010b. Land value tax in the context of sustainable urban development and assesment. Part II - Analysis of land valuation techniques: the case of Vilnius, *International Journal of Strategic Property Management* 14(2): 173–190.
- Resolution of the Republic of Lithuania of 15 April 2002 No. 534 On Approval of Regulations of the Real Property Cadastre of the Republic of Lithuania*. Valstybės žinios, 2002, No. 41-1539.
- Resolution of the Republic of Lithuania of 24 February 1999 No. 205 On the Procedure for Land Valuation*. Valstybės žinios, 1999, No. 21-597.
- Richmond, P. 2007. A roof over your head; house price peaks in the UK and Ireland, *Physica A* 375: 281–287.
- Riddel, M. 2004. Housing-market disequilibrium: an examination of housing-market price and stock dynamics 1967–1998, *Journal of Housing Economics* 13: 120–135.
- Riley, G. 2015. *Economics of housing*. Presentation [online], [cited 15 May 2015]. Available from Internet: <http://beta.tutor2u.net/economics/reference/revision-presentation-economics-of-housing>.
- Roberts, M. J.; Kirwan, B.; Hopkins, J. 2003. The incidence of government program payments on land rents: The challenges of identification, *American Journal of Agricultural Economics* 85(4): 762–769.
- Robson, M. 2003. Housing markets and regional unemployment flows in Great Britain, *The Manchester School* 71: 132–155.
- Roehner, B. M. 2006. Real estate price peaks: a comparative overview, *Evolutionary and Institutional Economic Review* 2(2): 167–182.
- Rosenberg, C. B. 2008. *The Baltic party need not end in a bust*. IMF Survey Magazine: Countries and Regions. 42 p.

- Rosser, J. B. Jr. 2000. *From catastrophe to chaos: a general theory of economic discontinuities*. 2nd ed. Kluwer Academic. 310 p.
- Rowley, S.; Ong, R. 2012. *Housing affordability, housing stress and household wellbeing in Australia*. Final Report No. 192. Melbourne: Australian Housing and Urban Research Institute. 98 p.
- Ruoppila, S. 2005. Housing policy and residential differentiation in post-socialist Tallinn, *International Journal of Housing Policy* 5(3): 279–300.
- Sabaliauskas, K. 2012. Housing and property market in Lithuania, in *FIG Working Week 2012, Knowing to manage the territory, protect the environment, evaluate the cultural heritage*, 6–10 May, 2012, Rome, Italy. 10 p.
- Sabaliauskas, K.; Kasperavičius, R. 2015. *Land administration system in Lithuania* [online], [cited 11 May 2015]. Available from Internet: <http://siteresources.worldbank.org/INTIE/Resources/475495-1202322503179/RKasperaviciusLandAdminSysPaper.pdf>
- Saiz, A. 2010. The geographic determinants of housing supply, *Quarterly Journal of Economics* 125(3): 1253–1296.
- Saks, R. 2005. *Job creation and housing construction: Constraints on employment growth in metropolitan areas*. Joint Center for Housing Studies. Harvard University, USA.
- Salmon, K. 2010. Boom to bust – reconstructing the Spanish economy, *International Journal of Iberian Studies* 23(1): 39–52.
- Sarkis J.; Meade L.; Presley A. 2008. Sustainability in the built environment: factors and a decision framework, in *The 39th Annual Meeting of the Decision Sciences Institute*, Proceedings, 2581–2586.
- Saurina, J. 2009. *Dynamic provisioning: The experience of Spain*. Crisis Response Note 7, The World Bank Group.
- Seelig, T.; Phibbs, P. 2006. Beyond the normative: Low income private renters' perspectives of housing affordability and need for housing assistance, *Urban Policy Research* 24: 53–66.
- Select Committee on Housing Affordability in Australia. 2008. *A good house is hard to find: Housing affordability in Australia*. The Senate, Commonwealth of Australia. 23 p.
- Shiller, R. J. 2005. *Irrational exuberance*. 2nd ed. Princeton and Oxford: Princeton University Press. 336 p.
- Shiller, R. J. 2007a. *Understanding recent trends in house prices and home ownership*. Working Paper no 28. Department of Economics, Yale University.
- Shiller, R. J. 2007b. *Low interest rates and high asset prices: An interpretation in term of changing popular models*. Cowles Discussion Paper No 1632. Department of Economics, Yale University.
- Siegan, B. H. 2009. The benefits of non-zoning, in R. G. Holcombe and B. Powell (Eds). *Housing America: Building out of a crisis*. New Brunswick, NJ: Transaction. Chapter 3.
- Siegel, J. J. 2003. What is an asset price bubble? An operational definition, *European Financial Management* 9(1): 11–24.
- Sowell, T. 2009. *The housing boom and bust*. New York: Basic Books. 116 p.
- Statistics Lithuania. 2015. *Statistical databases* [online], [cited 10 May 2015]. Available from Internet: <http://osp.stat.gov.lt/>

- Stein, J. 1995. Prices and trading volume in the housing market. A model with downpayment constraints, *Quarterly Journal of Economics* 110: 379–406.
- Stevens, G. 2011. *Testimony, Reserve Bank of Australia annual report (2010) to the Parliamentary (House of representatives) Standing Committee on Economics*. 26 August 2011 [online], [cited 10 May 2015]. Available from Internet: <http://www.aph.gov.au/hansard/rep/commtee/r242.pdf>.
- Stevenson, S. 2008. Modeling housing market fundamentals: empirical evidence of extreme market conditions, *Real Estate Economics* 36: 1–29.
- Stone, M. E. 1993. *Shelter poverty: New ideas on housing affordability*. Philadelphia, PA: Temple University Press. 420 p.
- Stone, M. E. 2006. What is housing affordability? The case for the residual income approach, *Housing Policy Debate* 17: 151–184.
- Stone, M. E.; Burke, T.; Ralston, L. 2011. *The residual income approach to housing affordability: The theory and the practice positioning paper No. 139*. Melbourne, Australia: Australian Housing and Urban Research Institute. 91 p.
- Su, J. J.; Cheung, W. K.; Roca, E. 2012. Are securitised real estate markets efficient? *Economic Modelling* 29: 684–690.
- Sutton, G. 2002. Explaining changes in house prices, *BIS Quarterly Review*, September, 48–55.
- Swinnen, J. F. M.; Vranken, L. 2009. *Land & EU accession: Review of the transitional restrictions by new member states on the acquisition of agricultural real estate*. CEPS, Brussels.
- Swinnen, J. F. M.; Vranken, L. 2010. *Review of the transitional restrictions maintained by Bulgaria and Romania with regard to the acquisition of agricultural real estate*. CEPS Special Report prepared for the European Commission, CEPS, Brussels.
- Syllignakis, M.; Kouretas, G. 2011. Dynamic correlation analysis of financial contagion: evidence from the Central and Eastern European markets, *International Review of Economics & Finance* 20: 717–732.
- Taylor, J. B., 2013. *Causes of the financial crisis and the slow recovery: A 10-year perspective*. Working Paper, Stanford University.
- Taylor, M. R.; Brester, G. W. 2005. Noncash income transfers and agricultural land values, *Review of Agricultural Economics* 27(4): 526–541.
- TEGOVA. 2012a. *European Valuation Standards*. 7th ed.
- TEGOVA. 2012b. *Lithuania. EVS Country Chapter (January 2012)*. 17 p.
- Terrones, M.; Otrok, C. 2004. *The global house price boom*. IMF World Economic Outlook, September.
- The Law on the Tax on the Immovable Property of Enterprises and Organizations*. Valstybės žinios, 1994, No. 59-1156; amendments 2004-04-15.
- Thomas, J. 2004. Modern land consolidation – recent trends on land consolidation in Germany, in *FIG Commission 7 – Symposium*, September, 2004, Volvic, France. 8 p.
- Thomas, J. 2006a. Attempt on systematization of land consolidation approaches in Europe, *Zeitschrift für Geodäsie Geoinformation und Landmanagement* 131: 156–161.
- Thomas, J., 2006b. Property rights, land fragmentation and the emerging structure of agriculture in Central and Eastern European countries, *Electronic Journal of Agricultural and Development Economics Food and Agriculture Organization* 3: 225–275.

- Tsai, H. J.; Chen, M. C. 2010. The impacts of extreme events of dynamic interactions on interest rate, real house price and stock markets, *International Research Journal of Finance and Economics* 35: 187–201.
- Tsatsaronis, K.; Zhu, H. 2004. What drives housing price dynamics: cross country evidence, *BIS Quarterly Review*, March, 65–78.
- Tse, C.-B.; Rodgers, T.; Niklewski, J. 2014. The 2007 financial crisis and the UK residential housing market: Did the relationship between interest rates and house prices change?, *Economic Modelling* 37: 518–530.
- Tsenkova, S. 2009. *Housing policy reforms in post-socialist Europe. Lost in transition*. Heidelberg: Physica. 262 p.
- Tsenkova, S.; Turner, B. 2004. The future of social housing in Eastern Europe: reforms in Latvia and Ukraine, *International Journal of Housing Policy* 4(2): 133–149.
- Tupėnaitė, L. 2010. *Multiple criteria assessment of the built and human environment projects*. PhD thesis. Vilnius: Technika.
- Tupėnaitė, L.; Kanapeckienė, L. 2009. Nekilnojamojo turto kainų burbulas ir jo pasekmės Baltijos šalims, *Mokslas – Lietuvos ateitis* 1(5): 103–108.
- United Nations (UN). 2002. *Lithuania. Country profile*. Johannesburg Summit, 2002.
- United Nations Human Settlements Programme (UN-Habitat). 2005. *Financing urban shelter: Global report on human settlements 2005*. Earthscan, USA.
- Urban Research Centre. 2008. *Housing affordability literature review and affordable housing program audit*. Urban Research Centre, University of Western Sydney. 43 p.
- Vanichvatana, S. 2007. Thailand real estate market cycles: Case study of 1997 economic crisis, *GH Bank Housing Journal* 1(1): 38–47.
- Vermeulen, W.; van Ommeren, J. 2009. Does land use planning shape regional economies? A simultaneous analysis of housing supply, internal migration and local employment growth in the Netherlands, *Journal of Housing Economics* 18(4): 294–310.
- Wang, L. 2014. Who moves East Asian stock markets? The role of the 2007–2009 global financial crisis, *Journal of International Financial Markets, Institutions & Money* 28: 182–203.
- Warnock, V. C.; Warnock, F. E. 2008. Markets and housing finance, *Journal of Housing Economics* 17: 239–251.
- Weiss, E.; Maliene, V. 2004. *Flurbereinigung in der Bundesrepublik Deutschland*. Vilnius: Technika. 103 p.
- Wheaton, W. 1987. The cyclical behavior of the national office market, *Journal of the American Real Estate and Urban Economics Association* 4: 281–299.
- Wheaton, W.; Nechayev, G. 2008. The 1998–2005 housing “bubble” and the current “corrections”: What’s different this time, *Journal of Real Estate Research* 30(1): 1–26.
- White, R. 2006. *Davy Research*, Dublin 29th March, 2006. Research note.
- Wilhelmsson, M. 2008. Regional house prices: an application of a two-equation model to the Swedish housing market, *International Journal of Housing Markets and Analysis* 11: 33–51.
- Wong, E., Fong, T.; Li, K.; Choi, H. 2011. *Loan-to-value ratio as a macroprudential tool: Hong Kong’s experience and cross-country evidence*. Hong Kong Monetary Authority. 48 p.
- Wong, J.; Fung, L.; Fong, T.; Sze, A. 2004. *Residential mortgage default risk in Hong Kong*. Hong Kong Monetary Authority Working Paper. 48 p.

- Wong, J.; Hui, C. M. 2006. Research notes – power of expectations, *Property Management* 24(5): 496–506.
- Wong, T. Y. J.; Hui, C. M. E.; Seabrooke, W. 2003. The impact of interest rates upon housing prices: an empirical study of Hong Kong's market, *Property Management* 21: 153–170.
- World Bank (WB). 1993. *Housing: Enabling markets to work*. World Bank Policy Paper No 11820. Washington DC: World Bank. 172 p.
- Yan, S.; Ge, X. J.; Wu, Q. 2014. Government intervention in land market and its impacts on land supply and new housing supply: Evidence from major Chinese markets, *Habitat International* 44: 517–527.
- Yavas, A.; Yang, S. 1995. The strategic role of listing price in marketing real estate: theory and evidence, *Real Estate Economics* 23: 347–368.
- Yeong-Hyub, K.; Reinen Short, J. 2008. *Cities and economies*. London, New York: Routledge. 193 p.
- Yunus, N. 2015. Trends and convergence in global housing markets, *Journal of International Financial Markets, Institutions & Money* 36: 100–112.
- Yunus, N.; Swanson, P. E. 2013. A closer look at the U.S. housing market: modeling relationships among regions, *Real Estate Economics* 41: 542–568.
- Zavadskas, E. K.; Kaklauskas, A. 1996. *Pastatų sistemos techninis įvertinimas* [Multiple criteria evaluation of buildings]. Vilnius: Technika. 279 p. (in Lithuanian).
- Zavadskas, E. K.; Kaklauskas, A.; Banaitis, A. 2002. *Statybos sektoriaus plėtots strategija. Ilgalaike Lietuvos ūkio (ekonomikos) plėtots iki 2015 metų strategija* [Construction Sector Development Strategy. Long-term Lithuanian economic development strategy until 2015] [online], [cited 15 May 2015]. Available from Internet: <http://www3.lrs.lt/docs2/RJZALJWG.DOC>.
- Zavadskas, E. K.; Kaklauskas, A.; Raslanas, S. 2005. Land taxation and sustainable urban development, in *33th Symposium International FESF: Recent Developments in Environmental Protection*, 2005, Vol. 40, Social Strategies, Bern: Peter Lang, 129–146.
- Zavadskas, E. K.; Kaklauskas, A.; Banaitis, A. 2010. Real estate's knowledge and device-based decision support system, *International Journal of Strategic Property Management* 14(3): 271–282.
- Zucchelli, C.; Kirsebom, D. 2009. *Kietas nusileidimas. Baltijos valstybės pavyzdys: pasakiškas ekonomikos pakilimas ir skausmingas nuosmukis*. Kaunas: Obuolys. 150 p. (in Lithuanian).

Statybos ir nekilnojamojo turto valdymas rinkos nestabilumo sąlygomis

MONOGRAFIJA

S a n t r a u k a

Krizė siejama su didelio masto kainų korekcijomis rinkose. Korekcijų priežastys ir pasekmės istoriniu požiūriu turi daug panašumų. Didžioji depresija XX a. trečiajame dešimtmetyje JAV, interneto burbulas, pastarųjų metų globali finansų krizė, prasidėjusi nekilnojamojo turto rinkoje JAV, yra daugelio veiksnių sąveikos rezultatas. Sakoma, kad visos krizės yra panašios, tačiau kiekviena krizė yra ypatinga savo istoriniu kontekstu. Pažymėtina ir tai, kad krizes lemia daugelis racionalių ir neracionalių veiksnių, todėl krizių priežastys ir pasekmės turi būti nagrinėjamos kompleksiskai.

Istorija rodo, kad nuolatinis nekilnojamojo turto kainų augimas nėra tvarus: anksčiau ar vėliau kainos stabilizuojasi, į rinką nebeateina naujų pirkėjų, krinta paklausa. Mažėjančios nekilnojamojo turto kainos skatina masinį turto išpardavimą, investuotojams tikintis atgauti bent dalį investuotos sumos, prastėja statybos verslo lūkesčiai, stabdomi arba paliekami ateičiai nauji statybos projektai. Po rinkos nuosmukio seka atsigavimo laikotarpis, kol prasideda naujas kainų kilimas ir ciklas kartojasi iš naujo.

Nekilnojamojo turto kainų kritimas turi dvejopą poveikį ekonomikai: pirma, mažėja investuotojų noras investuoti į naujos statybos projektus, antra, mažėja jų galimybės investuoti, nes mažėja jų turimo užstato vertė. Finansų institucijos dėl to gali patirti nuostolių. Be to, krizės metu stebimas kitas neigiamas padarinys – mažėja namų ūkių galimybės įsigyti nekilnojamojo turto, nes nuosmukio laikotarpiu mažėja kreditavimo galimybės, o krintant turto kainoms sudėtinga įkeisti turimą turtą ir gautas lėšas skirti vartojimui. Mažėjančios investicijos, mažėjantis ūkio kreditavimas, vartojimas, lėtėjantis ar net neigiamas ekonomikos augimas – visa tai lemia gerovės nuostolius tiek šalies ekonomikoje, tiek kitose glaudžiais prekybiniais ir finansiniais ryšiais susijusiose šalyse.

Statybos ir nekilnojamojo turto rinkos įtaką šalių ekonomikos raidai rodo pastarųjų metų globali finansų krizė, kurios ištakos siejamos su hipotetinių paskolų rinkos krize JAV, kuri palietė daugelio šalių, tarp jų ir Lietuvos, ekonomiką.

Pastarųjų metų krizė parodė, kad sudėtingos, kompleksinės išvestinės priemonės ne visada padeda efektyviai paskirstyti finansinius išteklius, t. y. nukreipti juos tiems investuotojams, kurių investicinių projektų grąža didžiausia, o riziką perkelti tiems, kurie gali ją prisiimti. Kita vertus, centriniai bankai ir vyriausybės greitai ir kryptingai reagavo į įvykius finansų rinkose, suteikdami reikiamą likvidumo ir mokumo pagalbą finansų institucijoms. Išryškėjo ir koordinuotų veiksmų, siekiant stabilizuoti situaciją pasaulio rinkose, būtinybė.

Statybos ir nekilnojamojo turto rinkos nuosmukiai, kaip rodo istorija ir pasaulio šalių patirtis, yra neišvengiami. Ekonominės krizės padariniai statybos ir nekilnojamojo turto sektoriui iškėlė naujų tikslų ir uždavinių. Statybos ir nekilnojamojo turto sektoriaus patirti nuostoliai skatina išsamiau analizuoti padėtį bei ieškoti būdų, kad šis sektorius veiktų efektyviai. Pasaulyje taikomos įvairios krizės valdymo strategijos, tačiau jos turi būti suderintos su konkrečios šalies ekonominiais, socialiniais, politiniais, teisiniais ir kitais aplinkos veiksniais. Statybos ir nekilnojamojo turto rinkos svyravimų ir juos veikiančių veiksnių analizė padeda geriau suvokti vykstančius procesus, o pagrindinių rodiklių išskyrimas ir ilgametis stebėjimas – prognozuoti rinkos pokyčius ateityje, taikyti tinkamas prevencines krizės valdymo priemones.

Monografijoje nagrinėjami aktualūs teoriniai ir praktiniai statybos ir nekilnojamojo turto rinkos svyravimų, juos lemiančių veiksnių ir krizės valdymo klausimai. Aptariama užsienio šalių ir Lietuvos nekilnojamojo turto rinkos svyravimų, jų padarinių ir problemų sprendimo patirtis. Išryškinama statybos ir nekilnojamojo turto rinkos svarba šalių ekonomikoms. Monografija yra tarpdisciplininio pobūdžio, autorių atliktus tyrimus galima priskirti statybos, ekonomikos ir vadybos kryptims. Leidinyje pateikta išsami nekilnojamojo turto rinkos analizė, tyrimų rezultatai yra aktualūs ne tik akademiniam kontekste, bet reikšmingi ir statybos bei nekilnojamojo turto rinkos dalyviams. Monografijoje pateikti duomenys, teorinės ir praktinės išvalgos gali būti naudingos nekilnojamojo turto vertintojams, vystytojams, statybos verslo įmonėms, valstybės institucijoms, taip pat doktorantams ir magistrantams.

Monografiją sudaro trys nuoseklios dalys, kuriose siekiama išsamiai analizuoti statybos ir nekilnojamojo turto rinkos segmentų ypatumus, svyravimus, krizes lemiančias priežastis ir pasekmes. Pateikiamos galimos priemonės statybos ir nekilnojamojo turto sektoriui valdyti rinkos nestabilumo sąlygomis.

Pirmoje dalyje siekiama atskleisti statybos ir nekilnojamojo turto rinkos ypatumus ir rinkos svyravimus lemiančias priežastis. Pateikiama kompleksinė nekilnojamojo turto samprata, išskiriami nekilnojamojo rinkos ypatumai, išryškinama

nekilnojamojo turto rinkos svarba šalių ekonomikos raidai. Remiantis užsienio šalių ir Lietuvos mokslininkų empirinių tyrimų rezultatais, išsamiai analizuojami statybos ir nekilnojamojo turto rinkos ciklai, jų indikatoriai, rinkos svyravimus lemiančios priežastys. Apžvelgiamos klasikinės kainų burbulų susiformavimo teorijos, jų tipai, susiformavimą lemiantys veiksniai, įtaka įvairių šalių ekonomikoms. Nagrinėjamos įvairių šalių taikytos fiskalinės ir monetarinės politikos priemonės statybos ir nekilnojamojo turto krizei valdyti bei įvairių autorių siūlomi statybos ir nekilnojamojo turto krizės valdymo modeliai. Išsamiai analizuojama Lietuvos statybos ir nekilnojamojo turto rinka, jos formavimosi ir plėtros tendencijos, pasitelkiant VĮ Registrų centro, Lietuvos statistikos departamento ir Europos Sąjungos statistikos tarnybos duomenis. Apibendrinami pagrindiniai statybos ir nekilnojamojo turto rinkos svyravimus lėmę veiksniai ir taikytos krizės valdymo priemonės bei jų poveikis šalies ekonomikai.

Antroje dalyje nagrinėjama žemės rinka, jos reguliavimo įtaka statybos ir nekilnojamojo turto rinkos pokyčiams bei žemės rinkos reguliavimo galimybės krizėms valdyti. Aptariami žemės rinkos ypatumai, nagrinėjami žemės sklypų paklausą ir pasiūlą lemiantys veiksniai, taip pat dėmesys skiriamas aktualioms žemės ūkio paskirties žemės valdymo klausimams. Remiantis užsienio šalių patirtimi nagrinėjama, kaip žemės rinkos reguliavimo sprendimai gali veikti statybos ir nekilnojamojo turto rinką ir kainų augimą. Išsamiai analizuojama Lietuvos žemės rinkos raida, teisinio reguliavimo kontekstas, žemės reformos įgyvendinimas ir pagrindinės problemos. Aptariama žemės registro ir kadastro sistema, nagrinėjami žemės konsolidacijos klausimai. Atliekama žemės sklypų rinkos pokyčių statistinė analizė. Nagrinėjama žemės planavimo ir valdymo sistemos įtaka statybos ir nekilnojamojo turto rinkai bei krizės valdymo galimybės.

Atsižvelgiant į tai, kad kokybiškas būstas už prieinamą kainą saugioje vietoje yra esminis žmogaus poreikis ir teisė, trečioje monografijos dalyje daugiausia dėmesio skiriama gyvenamosios paskirties nekilnojamojo turto rinkos analizei. Nagrinėjami gyvenamosios paskirties nekilnojamojo turto rinkos ypatumai, įtaka ekonomikai, paklausa ir pasiūla, veikiantys veiksniai. Remiantis užsienio ir Lietuvos autorių empirinių tyrimų rezultatais, aptariami įvairių šalių būsto politikos modeliai, būsto rinkos svyravimus lemiantys veiksniai, būsto darnos ir prieinamumo vertinimo rodikliai. Pasitelkiant Europos Sąjungos statistikos tarnybos, VĮ Registrų centro, Lietuvos statistikos departamento duomenis išsamiai analizuojami Europos Sąjungos šalių ir Lietuvos būsto darnumo ir kokybės rodikliai, remiantis daugiakriterio vertinimo metodais vertinami pagrindiniai būsto rinkos svyravimus lemiantys veiksniai ir būsto rinkos darnumas kitų šalių kontekste.

Mokslinė monografija yra Vilniaus Gedimino technikos universiteto mokslininkų ir VĮ Registrų centro specialistų bendrų mokslinių ir praktinių tyrimų rezultatas.



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Management of Construction and Real Estate Under Conditions of Market Instability

Monograph deals with significant theoretical and practical issues on construction and real estate market fluctuations, their determinants and crisis management measures. It discusses real estate markets fluctuations in Lithuania and abroad, their consequences and problem-solving experiences. Significance of construction and real estate market in the economy is emphasised. The monograph is interdisciplinary in nature; studies of the authors can be linked to construction, economics and management fields. Monograph contains a detailed analysis of the construction and real estate market, and the results are relevant not only in the academic context, but significant for all stakeholders of construction and real estate markets. The presented data, the theoretical and practical insights can be useful for real estate appraisers, developers, construction businesses, public authorities, as well as master and PhD students.

Monograph consists of three coherent chapters and aims to analyse fluctuations in different construction and real estate market segments in detail. Furthermore, determinants of crises and consequences as well as possible measures for construction and real estate management under conditions of market instability are presented.

Laura TUPĖNAITĖ, Jurga NAIMAVIČIENĖ,
Arvydas BAGDONAVIČIUS, Kęstutis SABALIAUSKAS

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